DOCUMENT RESUME

ED 239 920 SE 044 106

TITLE	Conservation for Children [Levels 1-6 and an All-Levels Supplement].
INSTITUTION	Cupertino Union School District, Calif.
PUB DATE	80
NOTE	873p.; Answer keys contain small print and may not reproduce well. The criterion-referenced test answer key in the Level 3 section is missing.
PUB TYPE	Guides - Classroom Use - Guides (For Teachers) (052)
EDRS PRICE	MF06/PC35 Plus Postage.
DESCRIPTORS	*Art Activities; *Basic Skills; Behavioral Objectives; Childrens Literature; Class Activities; *Conservation Education; Criterion Referenced Tests; Elementary Education; Elementary School Mathematics; Field Trips; Films; *Horticulture; *Interdisciplinary Approach; Language Arts; Music Activities; Resource Materials; Science Activities; Sequential Approach; Social Studies
IDENTIFIERS	PF Project

ABSTRACT

Developed to promote conservation awareness in elementary students, each of the six grade-level-sequenced activity guides provides: (1) a list of conservation concepts; (2) a criterion-referenced test; (3) a class record sheet; (4) a content guide; and (5) 90 student worksheets (40 for language arts, 20 for mathematics, 20 for social studies and science, and 10 for related activities). The related activities integrate conservation with arts and crafts, growing plants, or music and provide a sample of the activities found in the all-levels supplement. Test items and worksheets are correlated as are basic skill objectives and conservation topics. Each guide also provides sources of free and inexpensive materials, a list of children's books, and answers to the worksheets and the tests. The all-levels supplement contains a conservation calendar; general classroom ideas; activities for arts and crafts, music, and growing plants; a list of conservation agencies and groups; sources of free and inexpensive materials; ideas for field trips; sources of additional programs and materials; a list of films and film sources; and a bibliography of children's books. (EM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

Level 1

ED223992

Conservation For Children

[Levels 1-6 and an All-Levels Supplement]

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

This activity guide is the first in a series of six grade level sequenced guides.

It has been developed to promote conservation awareness, understanding and action for elementary school children.

SE044106

© Cupertino Sch. Dist.
1980

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Marilyn Bodourian

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

An ESEA Title IV-C Project, Number 6298

Produced by Cupertino Union School District
10301 Vista Drive
Cupertino, California 95014
(408) 252-3000

Carl W. Krause, Superintendent

Board of Education

Robert D. Hall, President
Severene Bylin
Roger C. Halstead
Valerie Harrison
Claire Hobbs

PROJECT STAFF

State Consultant: William A. Johnson

Associate Superintendent: William Zachmeier

Project Administrator, Principal: Rex Wetzel

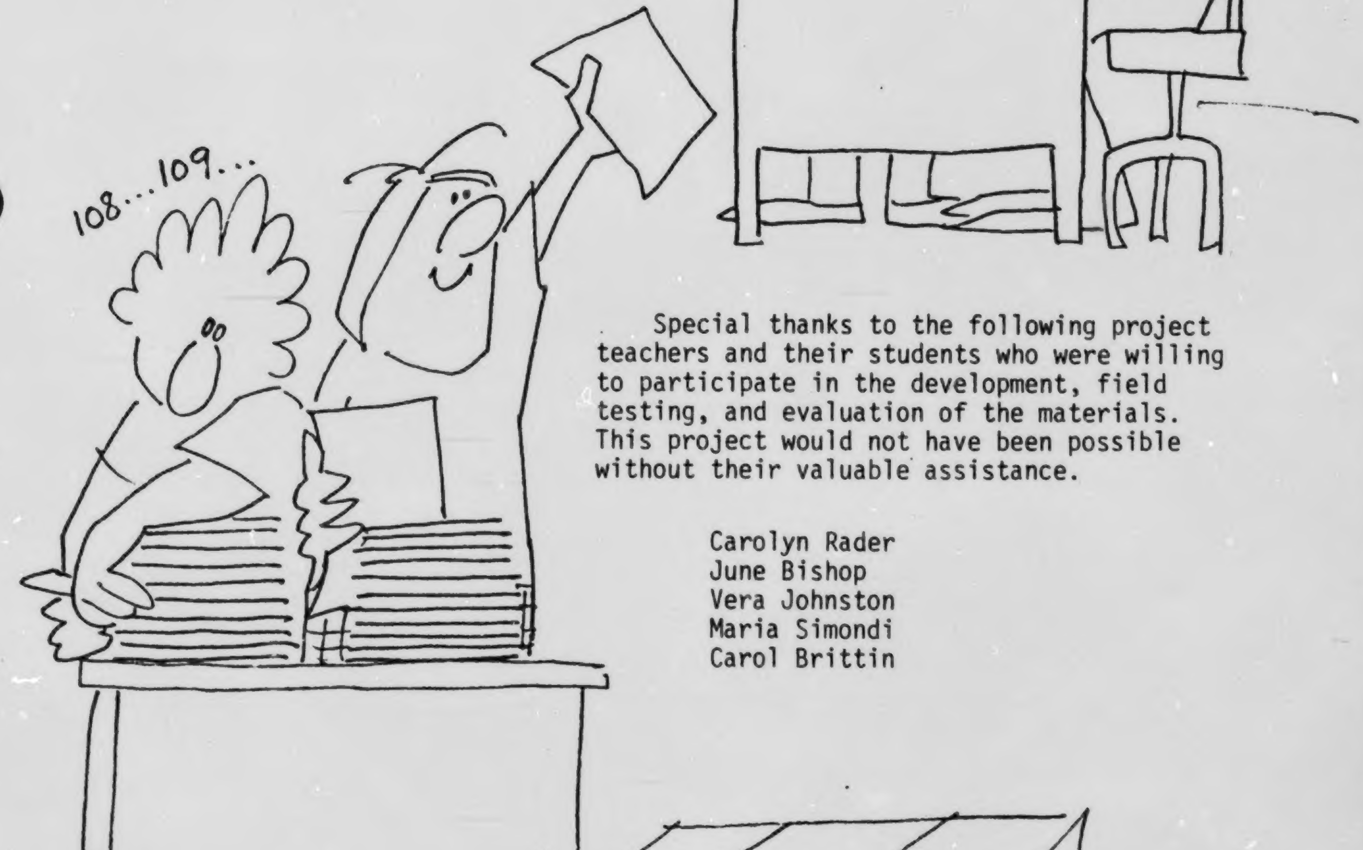
Director: Marilyn Bodourian

Program Clerks: Carole Kumaishi
Alice Ruick

Illustrator: Gen McKenzie

Evaluators: Lynn Fossum
Eloise Martin Appel

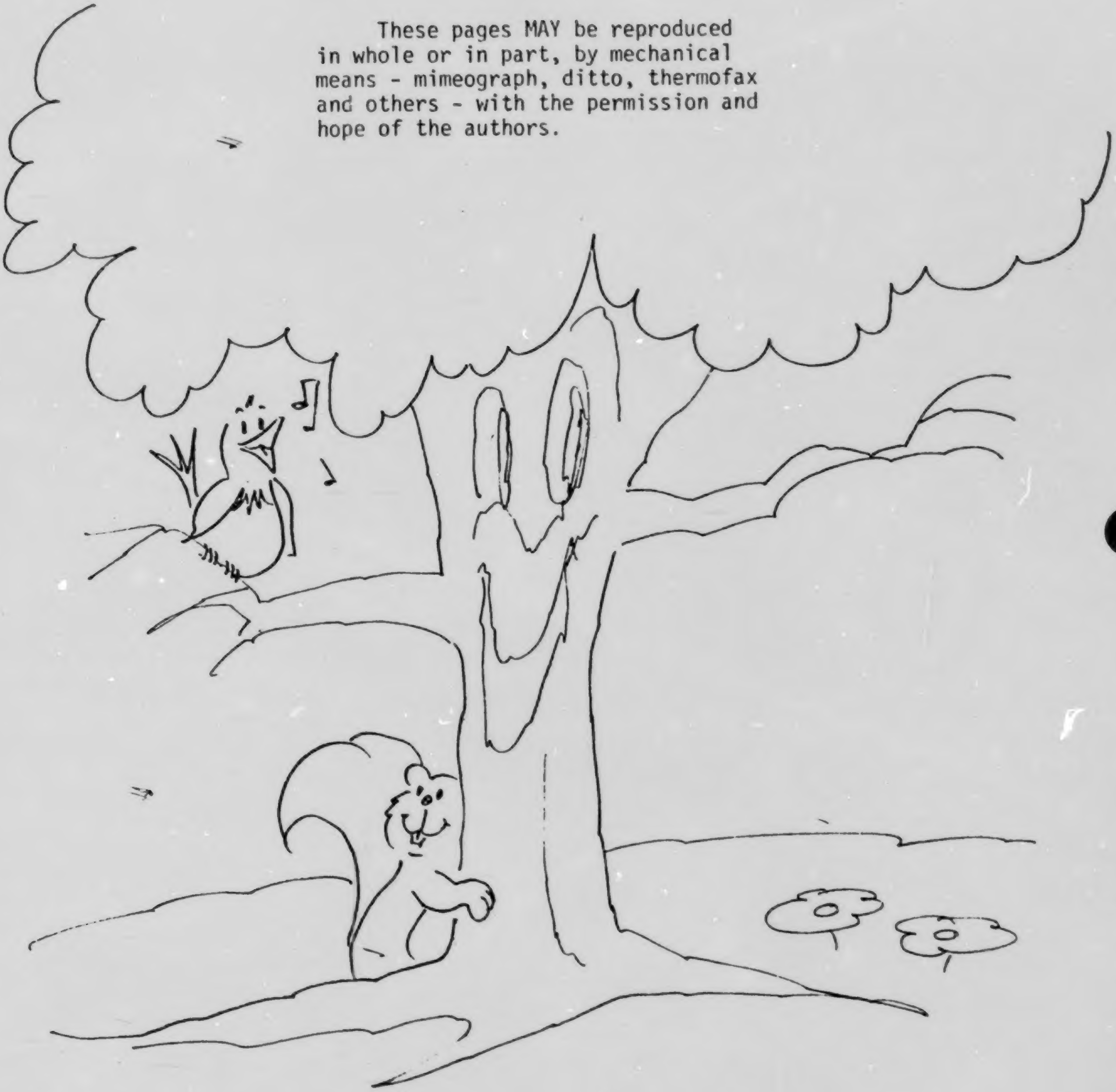
Consultants: Environmental Volunteers
Jane Hall



Special thanks to the following project teachers and their students who were willing to participate in the development, field testing, and evaluation of the materials. This project would not have been possible without their valuable assistance.

Carolyn Rader
June Bishop
Vera Johnston
Maria Simondi
Carol Brittin

These pages MAY be reproduced in whole or in part, by mechanical means - mimeograph, ditto, thermofax and others - with the permission and hope of the authors.



The pages in this book are printed on 100% recycled paper.

TABLE OF CONTENTS

PART 1

Introduction
Purpose, contents, how to use the materials 100

Conservation Concepts 102

Criterion Referenced Test .103

Test-Worksheet Correlation 105

Content Guide 106

PART 2

Student Worksheets

Language Arts 110

Mathematics 150

Social Studies, Science 170

Related Activities 190

APPENDIX

Answers
Student Worksheets
Criterion Referenced Test

INTRODUCTION

PURPOSE:

The CONSERVATION FOR CHILDREN materials were developed to enable teachers to provide relevant conservation information for students in an easy and practical manner.

As our natural resources decline, both in quality and quantity, the importance of conservation education cannot be understated. As children become aware of environmental problems, they can better understand the precedents and consequences of such and their interdependency with the environment. This knowledge will hopefully lead to positive action.

CONTENTS:

Each grade level guide includes:

1. Conservation Concepts -

   These grade level concepts have been determined by teachers to meet the basic interests of students and to correlate with other grade level subject matter.

2. Criterion Referenced Test -

   A student test designed to measure pre and post knowledge of the grade level conservation concepts.

3. Class Record Sheet -

   A recording sheet for teacher use in programming instruction. This page also correlates the test items and student worksheets.

4. Content Guide -

   The guide correlates accepted basic skill objectives and conservation topics. The listing of student worksheets includes

forty pages of language arts activities, twenty pages of mathematics, twenty pages of social studies and science, and ten pages of related activities.

5. Student Worksheets -

Ninety worksheets which integrate basic skills objectives and conservation information. The worksheet pages were planned and developed by students and teachers and are intended for duplication. They are readily usable in the classroom and require no additional materials, time or space. These worksheets were designed to be relevant, motivating and fun for children.

USING THE MATERIALS:

The CONSERVATION FOR CHILDREN materials may be used as a primary resource for teaching basic skills, as supplementary materials to a core program, as enrichment activities, skill review, or as a unit of study.

The worksheets have purposefully not been sequenced or arranged in any order, other than subject area, to encourage teachers to pick and choose those that will meet the needs of their students. Teachers may use the Content Guide to identify basic skills and/or conservation topics for each worksheet. Conservation concepts are covered in each basic skill area and are presented in several worksheets with varying degrees of difficulty. Each worksheet is independent of the others.

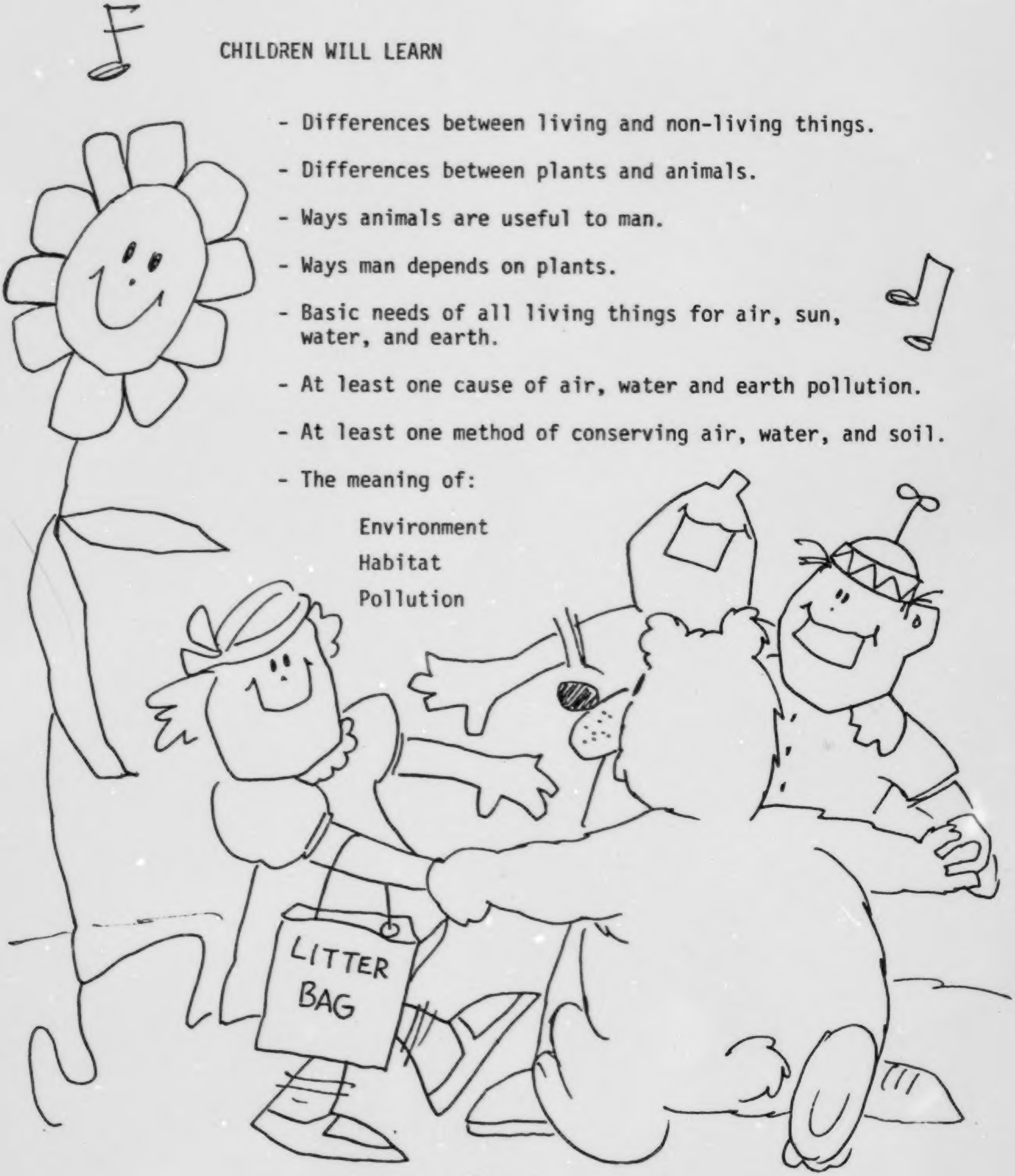
The criterion referenced test is included for teachers who want to assess student growth in conservation knowledge. Recording pretest results on the class record sheet will enable teachers to program the materials to meet individual and group needs.

LEVEL 1 - CONCEPTS

CHILDREN WILL LEARN

- Differences between living and non-living things.
- Differences between plants and animals.
- Ways animals are useful to man.
- Ways man depends on plants.
- Basic needs of all living things for air, sun, water, and earth.
- At least one cause of air, water and earth pollution.
- At least one method of conserving air, water, and soil.
- The meaning of:

  Environment
  Habitat
  Pollution



CONSERVATION FOR CHILDREN

Criterion Referenced Test (1)

Name ____________________

Date ____________________
Pre Post

Pre Post

____ ____ 1. Is a tree a living thing? ____________

____ ____ 2. How are plants and animals different?

____

____

____ ____ 3. What do all plants and animals need to live?

____

____ ____ 4. How do animals help us?

____

____

____ ____ 5. How do plants help us?

____

____

____ ____ 6. What does all our food come from?

____

____ ____ 7. What does "environment" mean?

____

____

Pre Post

____ ____ 8. What is a "habitat"?

____ ____ 9. Tell me one cause of air pollution. Water pollution. Land pollution.

Air -

Water -

Land -

____ ____ 10. Tell me one way we can keep the air clean. Keep the water clean. Keep the land clean.

Air -

Water -

Land -

CONSERVATION FOR CHILDREN

Class Record Sheet
Criterion Referenced Test - Grade 1

Question #	No. right on Pre-test	No. right on Post-test	Student Worksheets
1. Is a tree a living thing			110, 111, 112, 151 152, 154, 155, 156 170, 171
2. How are plants and animals different?			112, 172
3. What do all plants and animals need to live?			110, 112, 113, 114 116, 127, 143, 157 173
4. How do animals help us?			121, 122, 128, 162 163
5. How do plants help us?			117, 118, 119, 120 122, 123, 124, 125 126, 140, 161, 164 165, 174
6. What does all our food come from?			122, 162, 163, 175
7. What does "environment" mean?			133, 159, 160, 176
8. What is a "habitat"?			124, 130, 131, 132 150, 177
9. Tell me one cause of air pollution. Water pollution. Land pollution.			136, 137, 138, 139 145, 146, 149, 153 166, 167, 168, 178 179, 180, 181, 182 183, 184, 185, 187
10. Tell me one way we can keep the air clean. Keep the water clean. Keep the land clean.			141, 142, 143, 144 145, 146, 147, 148 149, 153, 168, 169 178, 179, 180, 181 182, 184, 185, 186 187, 188, 189

Page No.	Skill	Conservation Topic	District Curriculum
Language Arts			
110	Identification	Living things	
111	Writing, simple sentence	Living things	1.450
112	Literal comprehension	Differences, plants, animals	1.200
113	Spelling	Basic needs	
114	Interpretive comprehension	Plant needs	1.225
115	Word meaning	Vocabulary	1.153
116	Color words	Plant needs	
117	Beginning consonants	Plant products	1.028
118	Word meaning	Plant products	1.153
119	Sequencing, visual	Plant products	
120	Interpretive comprehension	Food from plants	1.225
121	Literal comprehension	Food from plants	1.200
122	Sequencing, visual	Food from plants	
123	Sequencing, visual	Uses of plants	
124	Following directions	Trees	
125	Categorizing	Tree products	1.375
126	Following directions	Fruit	
127	Color words	Animal needs	
128	Literal comprehension	Use of animals	1.200
129	Literal comprehension	Animal characteristics	1.200
130	Interpretive comprehension	Animal habitats	1.225
131	Interpretive comprehension	Habitats	1.225
132	Categorizing	Water habitats	1.375

Page No.	Skill	Conservation Topic	District Curriculum
133	Categorizing	Environments	1.375
134	" (2 pages)	"	1.375
135	Word meaning	Vocabulary	1.153
136	Literal comprehension	Pollution	1.200
137	Color words	Air pollution	
138	Interpretive comprehension	Air pollution, causes	1.225
139	Literal comprehension	Air pollution	1.200
140	Alphabet, sequence	Trees, clean air	
141	Alphabet, letter following	Litter	
142	Alphabet, missing letter	Litter	
143	Identification	Water	
144	Spelling	Air, transportation	
145	Literal comprehension	Air pollution	1.200
146	Sentence completion	Conservation methods	
147	Interpretive comprehension	Conservation methods	1.225
148	Shape discrimination	Conservation methods	
149	Literal comprehension	Water pollution	1.200
Math			
150	Counting	Habitats	1.11030
151	Matching	Living things	
152	Comparisons, smaller	Living things	
153	Counting	Litter	
154	Shape recognition	Trees	
155	Number words, matching	Living things	

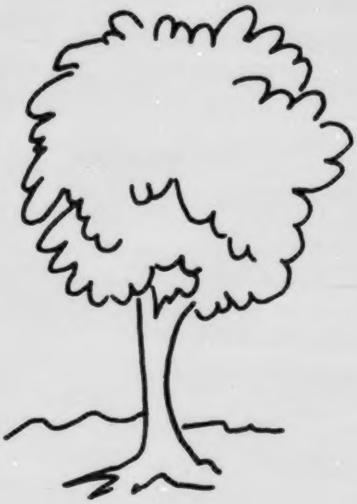
Page No.	Skill	Conservation Topic	District Curriculum
156	Ordinal numbers	Living things	
157	Numbers, greater than 5	Basic needs	
158	Counting, more or less	Habitats	
159	Add, subtract -10	Environment	
160	Number value	Environments	
161	Number words	Food, plants	
162	Sequencing	Food, plants	
163	Ordinal numbers	Food, plants and animals	
164	Add, subtract -10	Plant products	
165	Number sentences	Clean air	
166	Number recognition	Air pollution	
167	Number sentences	Air pollution, causes	
168	Counting	Litter	
169	Counting	Recycling	
Social Studies/Science			
170	Classification	Living things	
171	Classification	Living things	
172	Identification	Animals	
173	Critical thinking	Food, animals	
174	Critical thinking	Plant products	
175	Sequencing	Food, plants	
176	Critical thinking	Environments	
177	Factual knowledge	Habitats	
178	Critical thinking	Conservation methods	

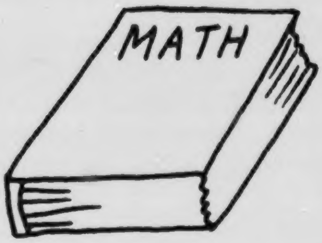
Page No.	Skill	Conservation Topic	District Curriculum
179	Visual matching	Environments	
180	" " (2 pages)	"	
181	Critical thinking	Pollution	
182	Rebus interpretation	Pollution	
183	Factual knowledge	Air pollution	
184	Critical thinking	Transportation	
185	Classification	Water pollution	
186	Interpretive comprehension	Pollution solutions	
187	Interpretive comprehension	Water pollution	
188	Identification	Environmental workers	
189	Visual discrimination	Conservation	
Related Activities			
190	Introduction		
191	Arts and Crafts	Nature prints	
192	Arts and Crafts	Egg carton jewelry	
193	Arts and Crafts	Leaf tiles, ceramic	
194	Growing Plants	Eggheads	
195	Growing Plants	Sunflowers	
196	Music	"The Ballad of Woodsy Owl"	
197	Music	"Help Woodsy Spread the Word"	
198	Send Aways	Conservation materials	
199	Student bibliography	Conservation books, fact and fiction	

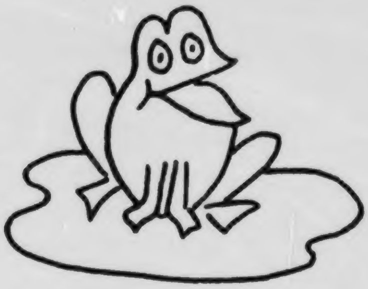
Name

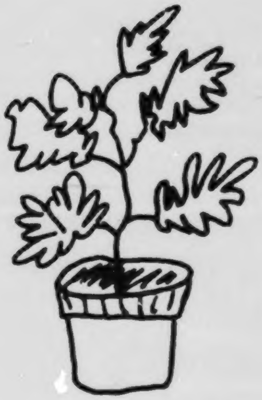
Plants and animals are living things.
They need sun, air, soil and water to live.

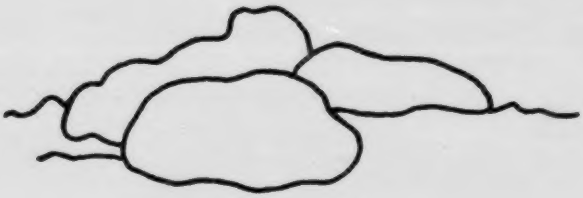
Color the things that are living.
Put an X on the things that are not living.

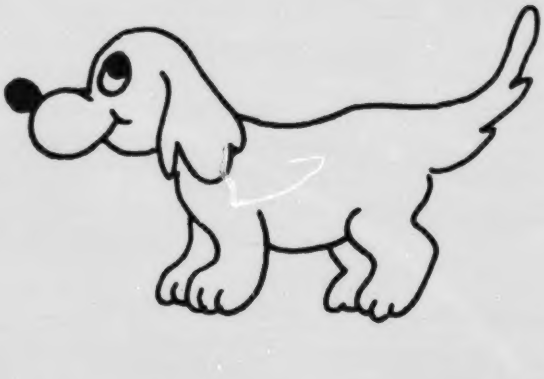


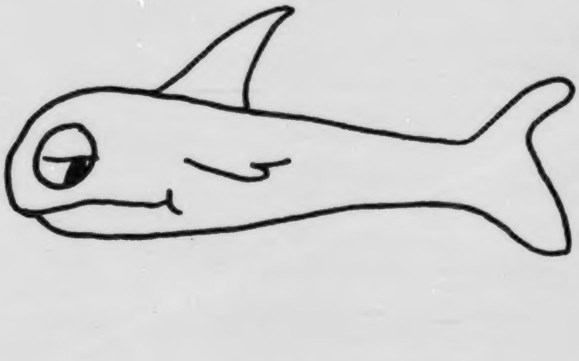












Name

Are you a living thing? Yes No

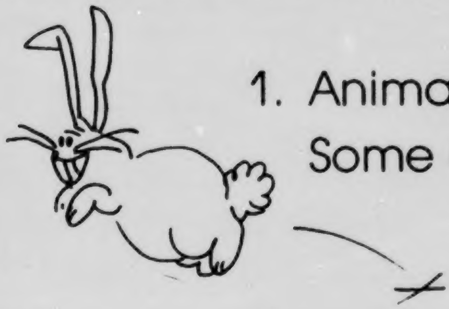
Draw a picture of another living thing.

Write a sentence about your picture.

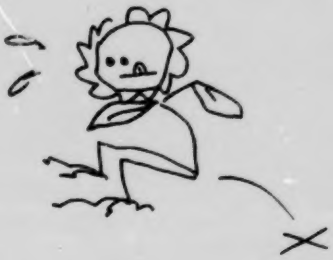
Name ______________________________

Both plants and animals are living things. They need air, water, sun and soil to live. But, there are some ways they are not alike.

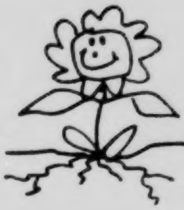
Circle and color the picture that is correct.

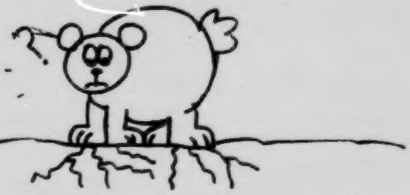


1. Animals can move.
Some can run and jump.

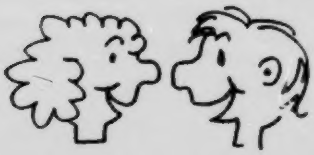


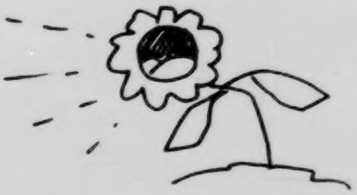
2. Plants have roots.



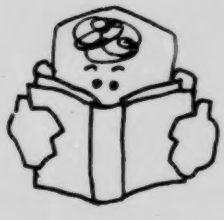


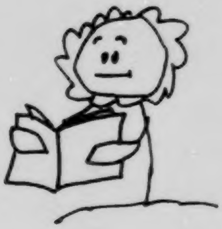
3. Animals can make sounds.





4. Some animals can
read a book.





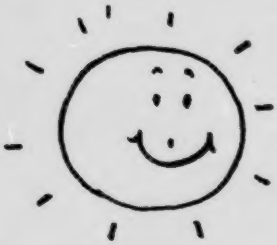
Are you a plant or an animal?

Write the word. ______________________________

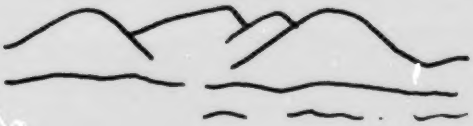
Name ______________________________

Fill in the missing letters:

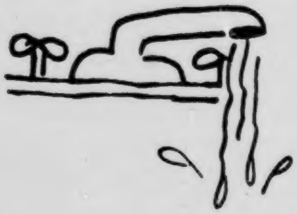
All plants and animals need.....



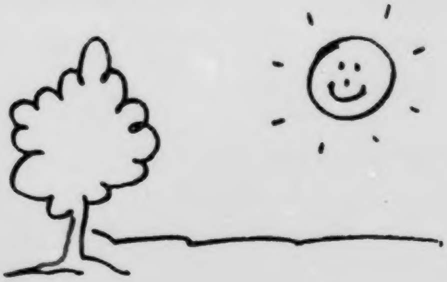
su__



soi__



wa__er



ai__

Find the words that tell what all plants and animals need in the "word find".

Circle them.

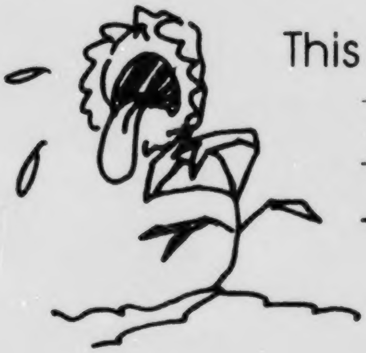
M	S	U	N	W
L	O	X	P	A
A	I	R	L	T
E	L	J	K	E
Z	F	S	I	R

Name

All plants and animals need soil, air, sun, and water.

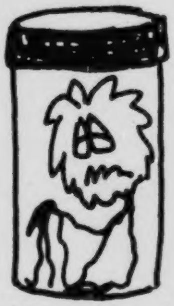
Use these words to fill in the blanks:

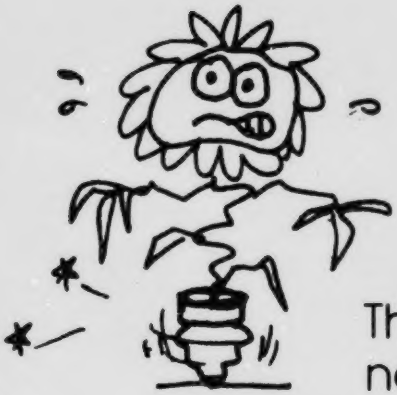
soil air sun water



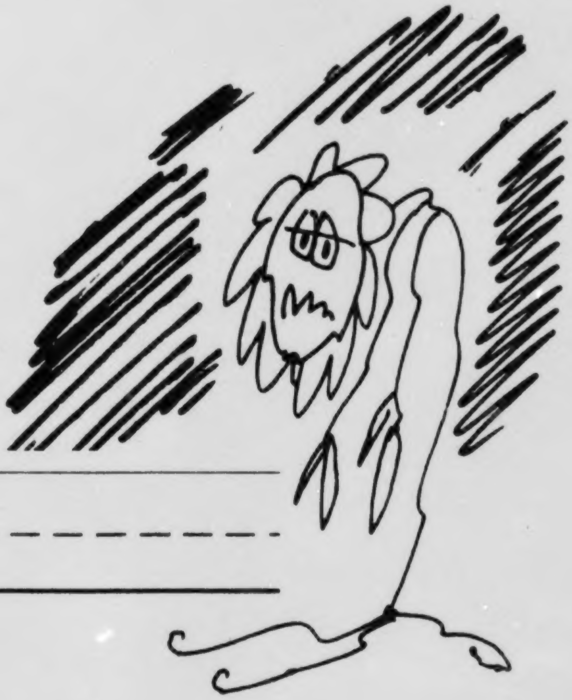
This plant needs more

This plant needs more



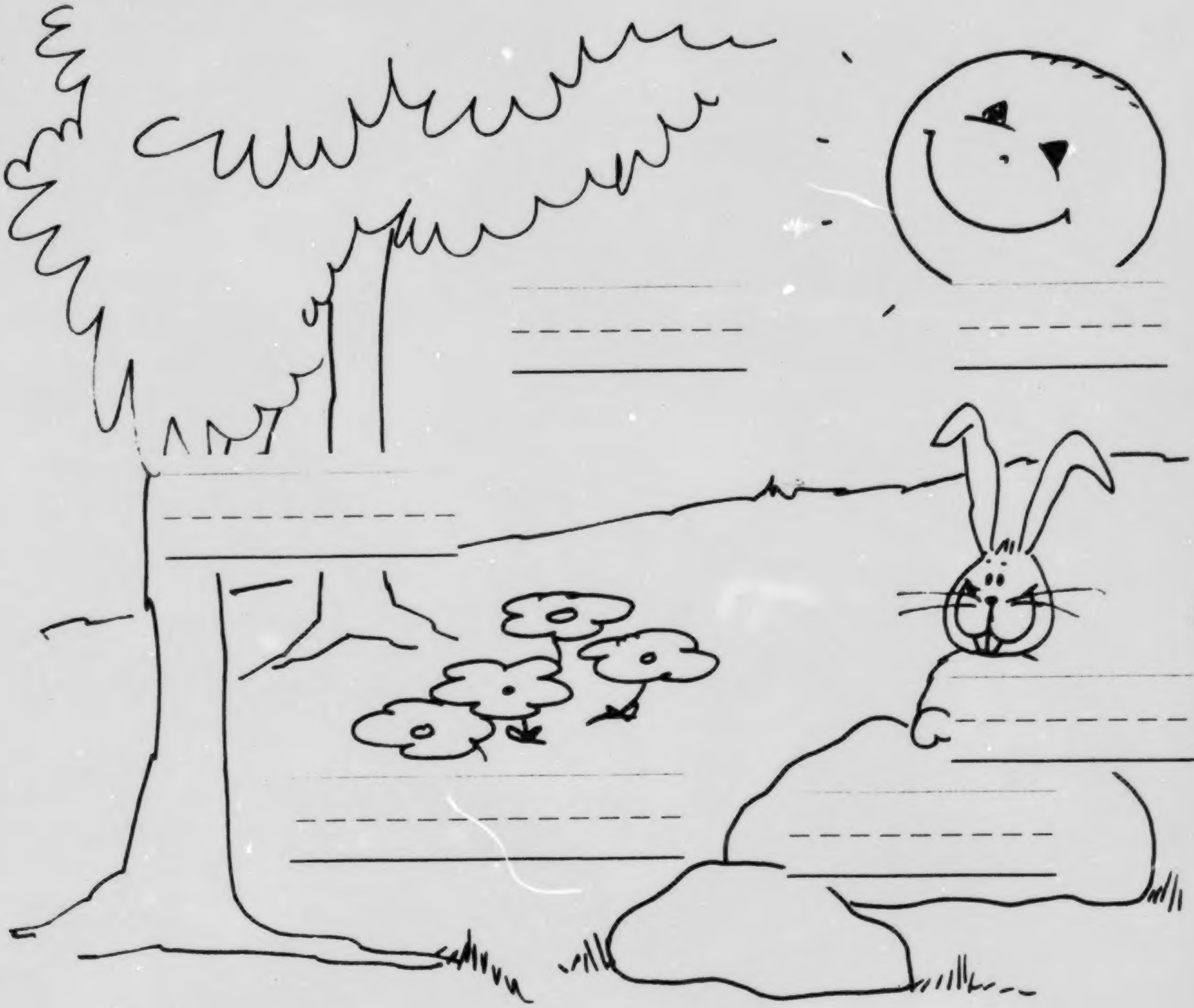


This plant needs more



This plant needs more

Name ____________________

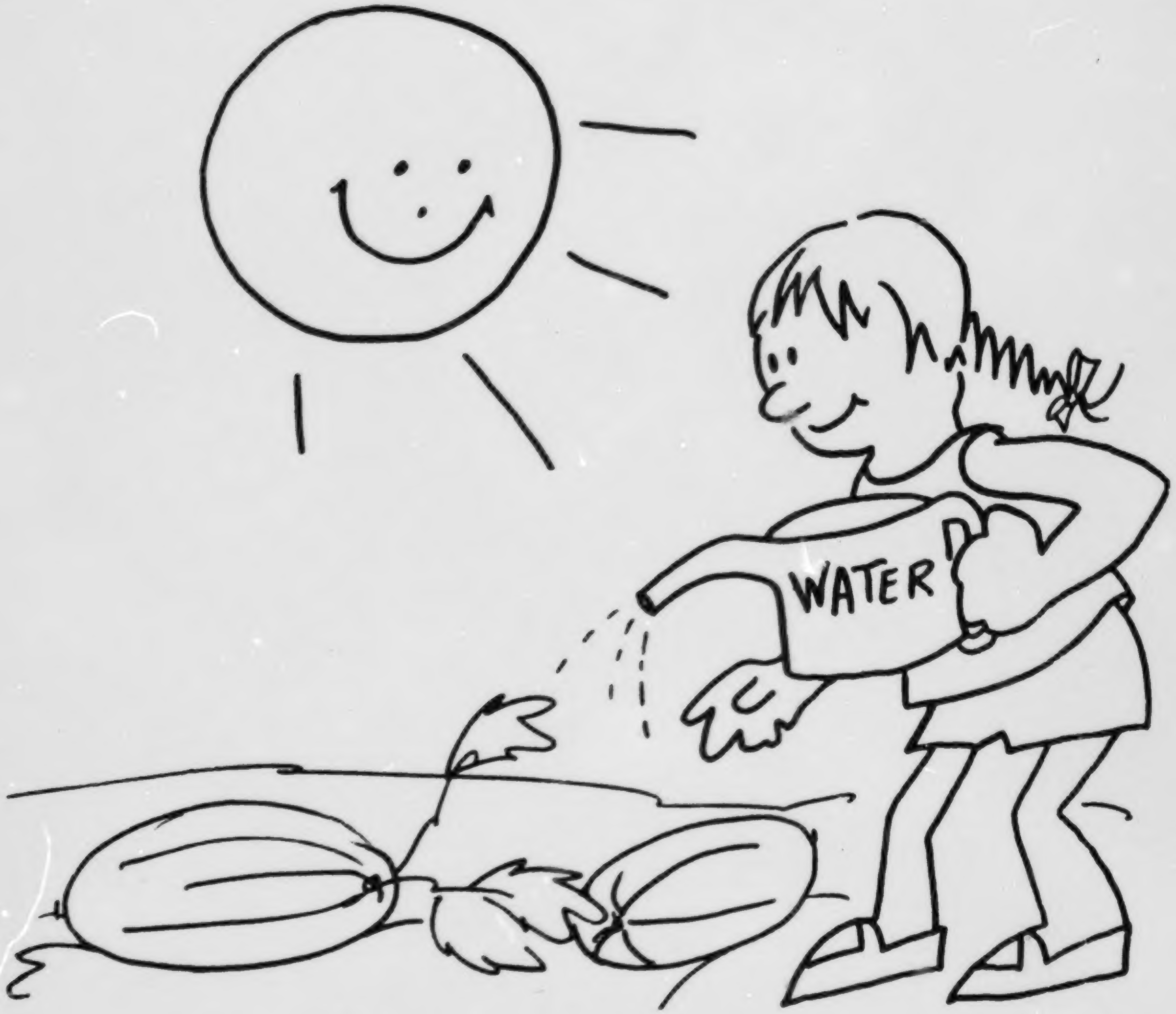


Write the words below on the correct spaces in the picture.

sun   air   trees

flowers   rabbit   rock

Name



All plants need water.
Color the watering can red.

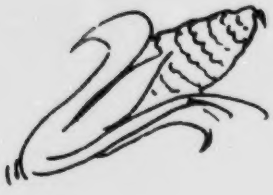
All plants need sun.
Color the sun yellow.

All plants need air.
Color the sky blue.

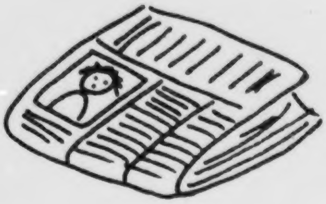
Most plants need soil.
Color the soil brown.

Name

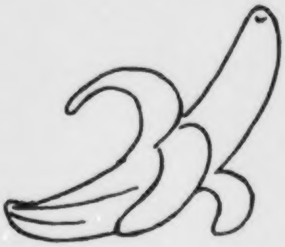
All these things come from plants. Circle the letter that is at the beginning of each word.



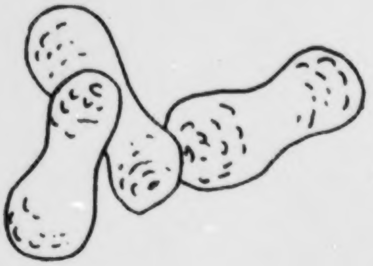
c r g



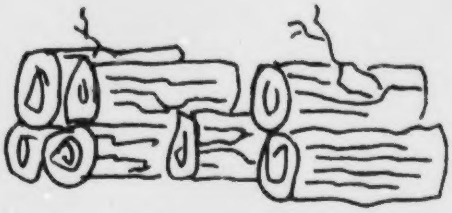
d n s



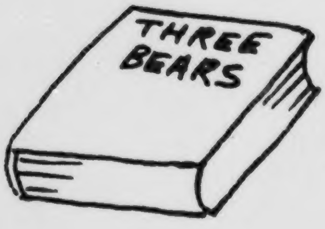
d b f



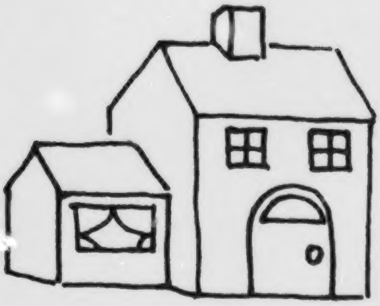
h p d



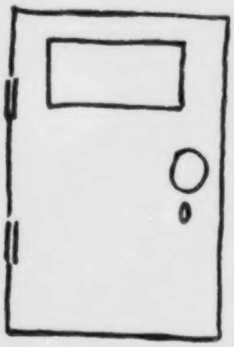
j w r



b k d



h t l



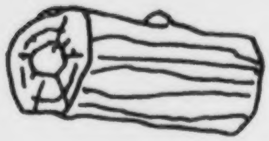
m p d

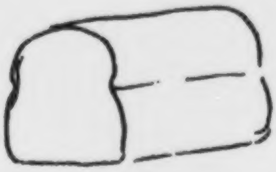
Name

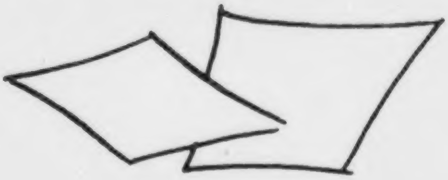
Here are some of the many things we get from plants. Write the word under the picture.

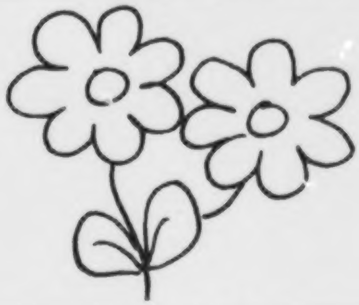
wood fruit paper

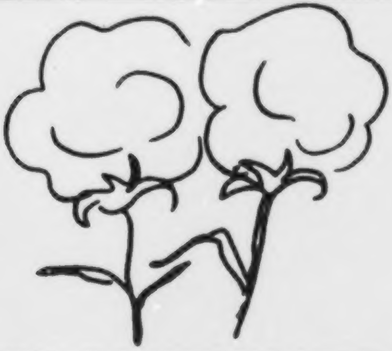
cotton flowers bread

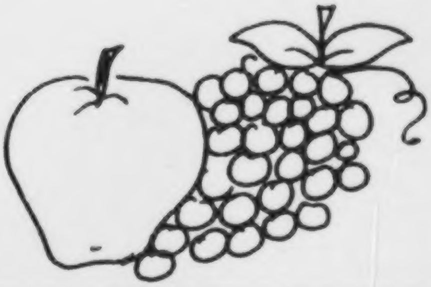






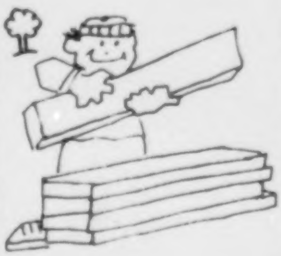


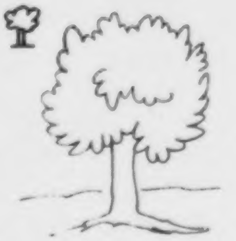


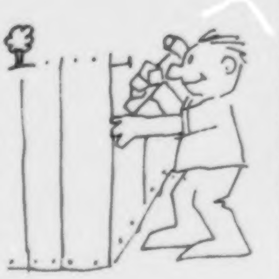


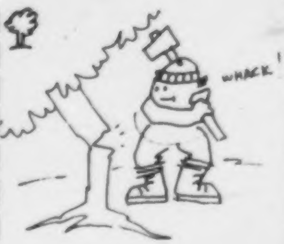
Name

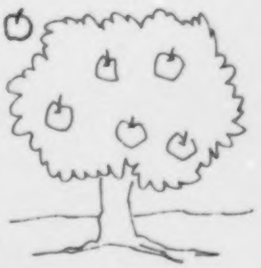
People use plants in many ways.
Cut out the pictures on the dotted lines.
Paste them in the right order.

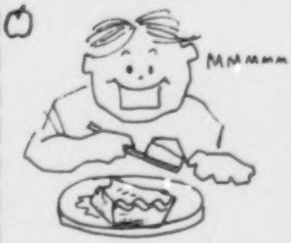


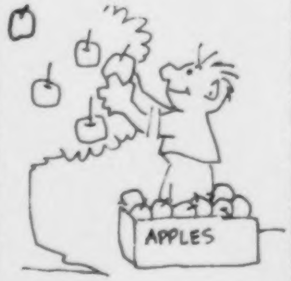


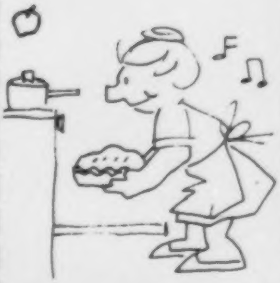


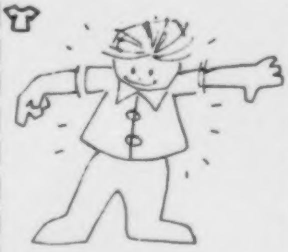


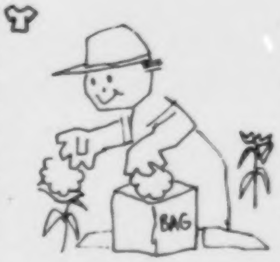


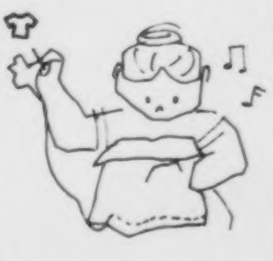


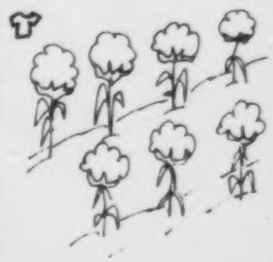










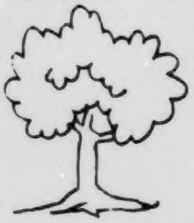
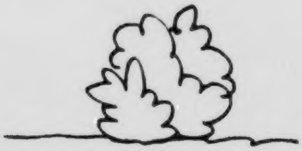
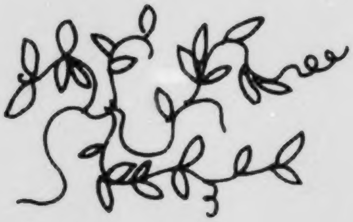


Name

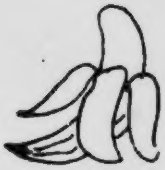
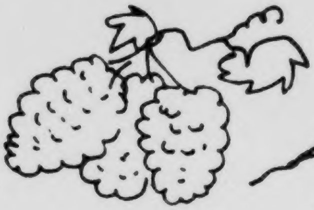
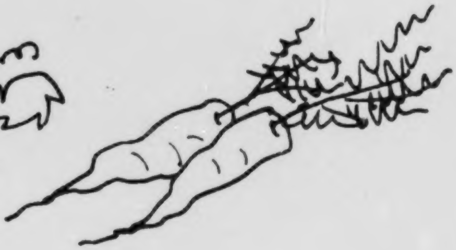
Our food comes from plants.

Circle the correct picture to finish each sentence.

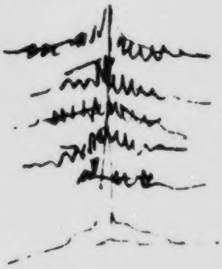
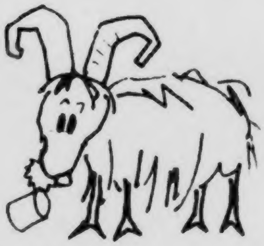
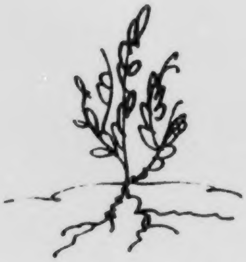
1. Apples grow on a

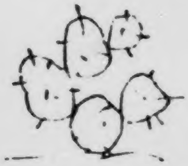
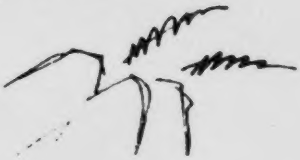
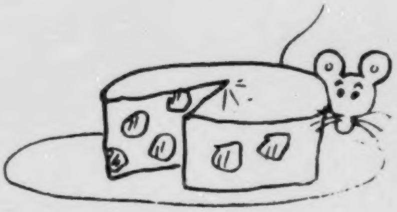
2. Some jam is made from

3. Peanut butter comes from

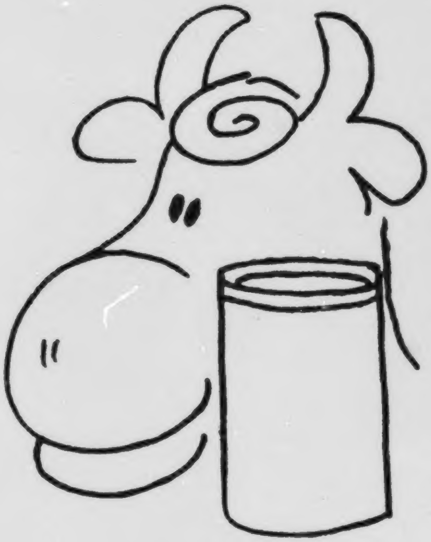
4. Bread is made from

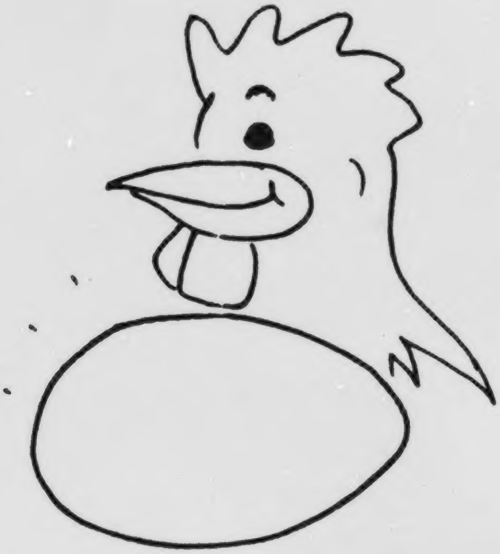




Use the back of this paper to show where oranges grow.

Name

This is a glass of milk.
Milk does not grow on plants.
It comes from cows.
Cows need plants to eat.





This is an egg.
Eggs do not grow on plants.
Hens lay eggs.
Hens need plants to eat.

Draw lines to finish the sentence.

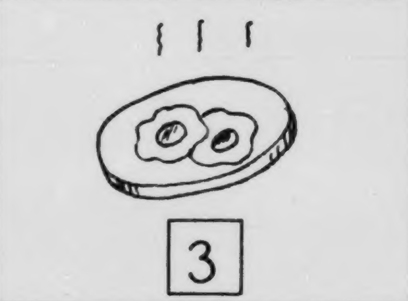
Milk comes from	plants.
Eggs come from	cows.
Hens eat	eggs.
Cows eat	plants.
Hens lay	hens.

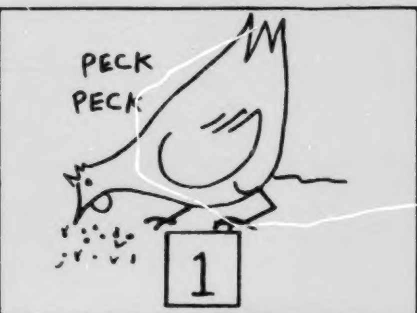
Name

All of our food comes from plants.

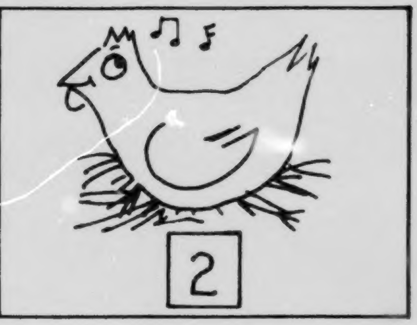
Put the number 1, 2 or 3 in the boxes in each row to show how this happens.

Example

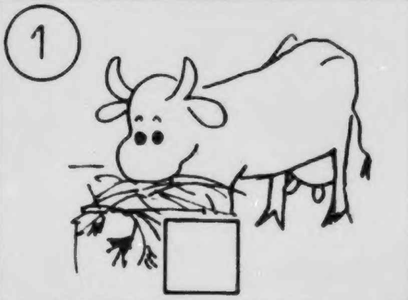

3

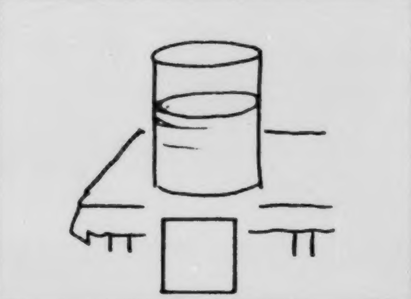


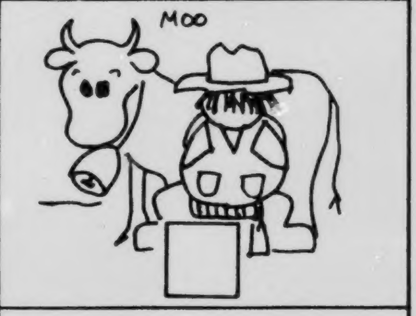
1


2

①

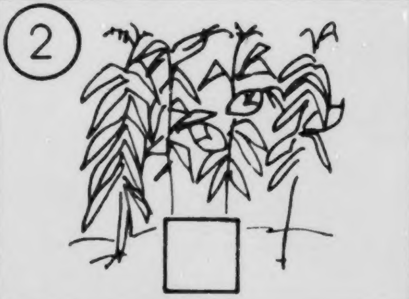

☐

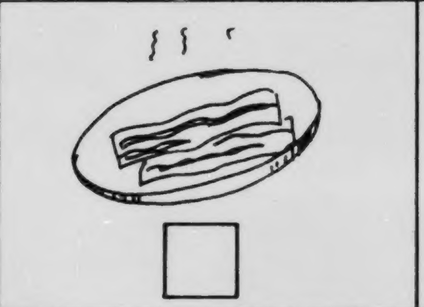

☐

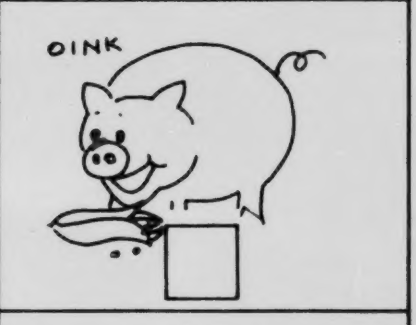


☐

②

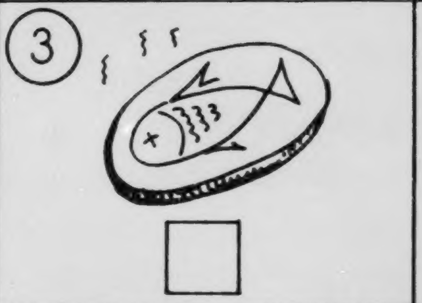

☐

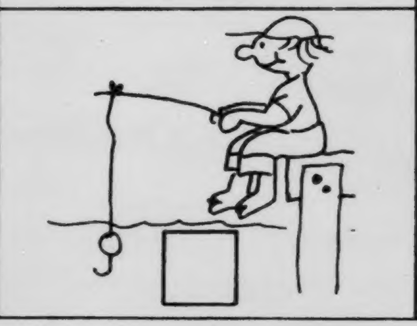

☐

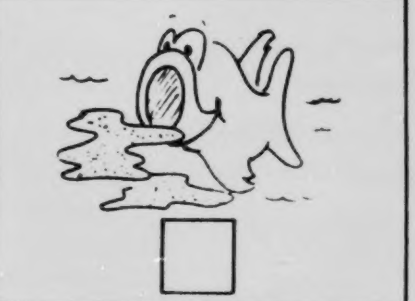


☐

③


☐

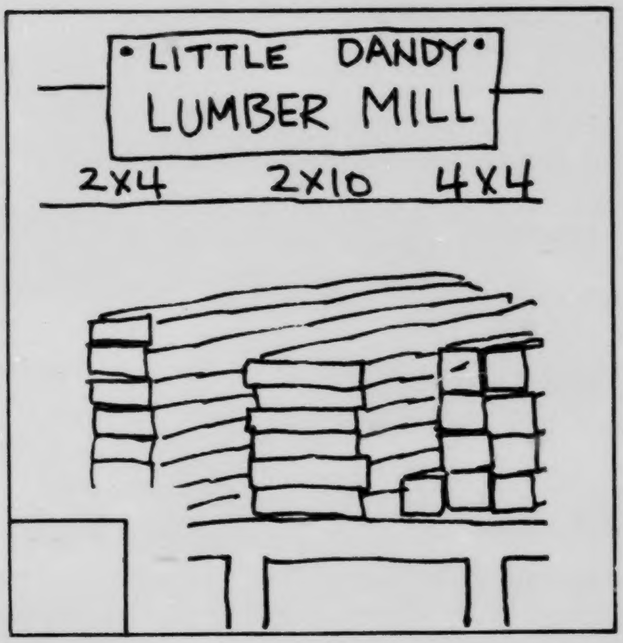

☐

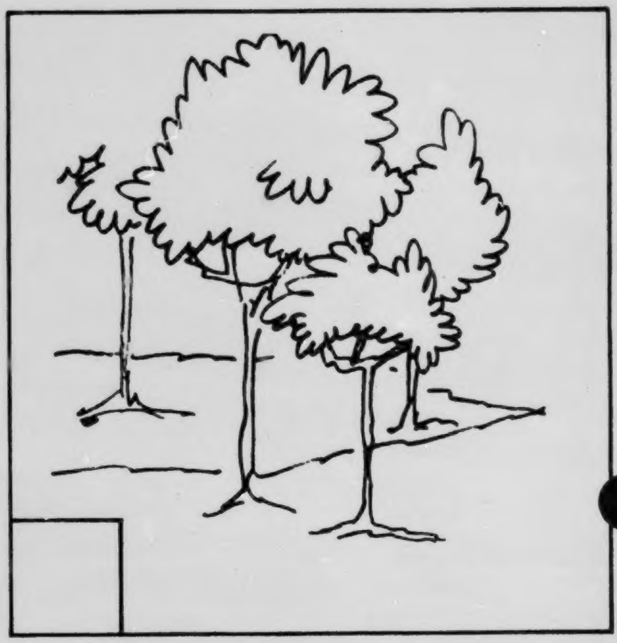

☐

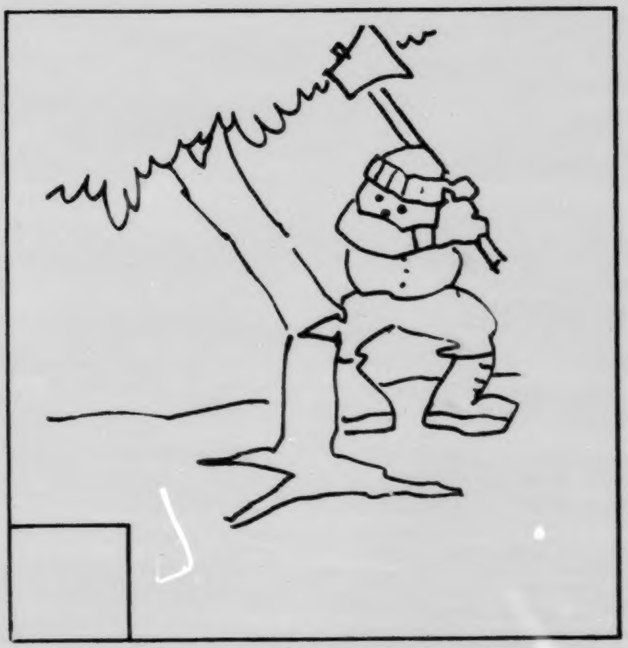
Name

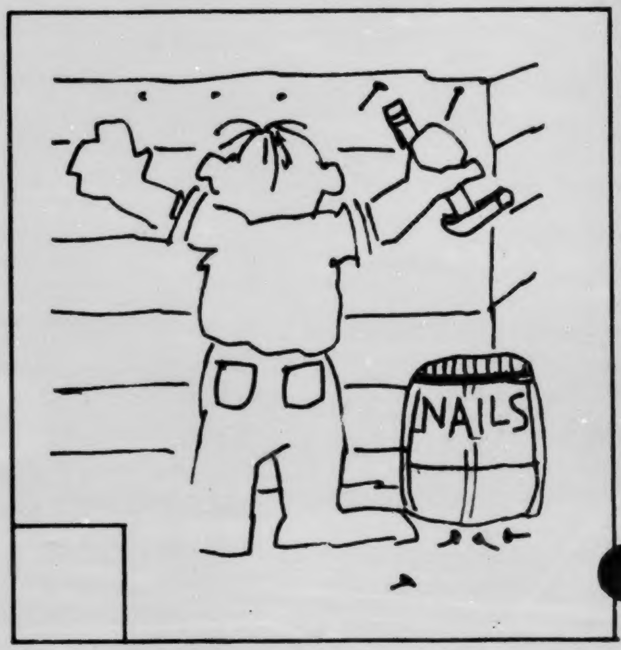
We get many things from plants.
Trees are plants.
We get wood from trees.

Put 1, 2, 3 or 4 to show how a tree becomes a house.

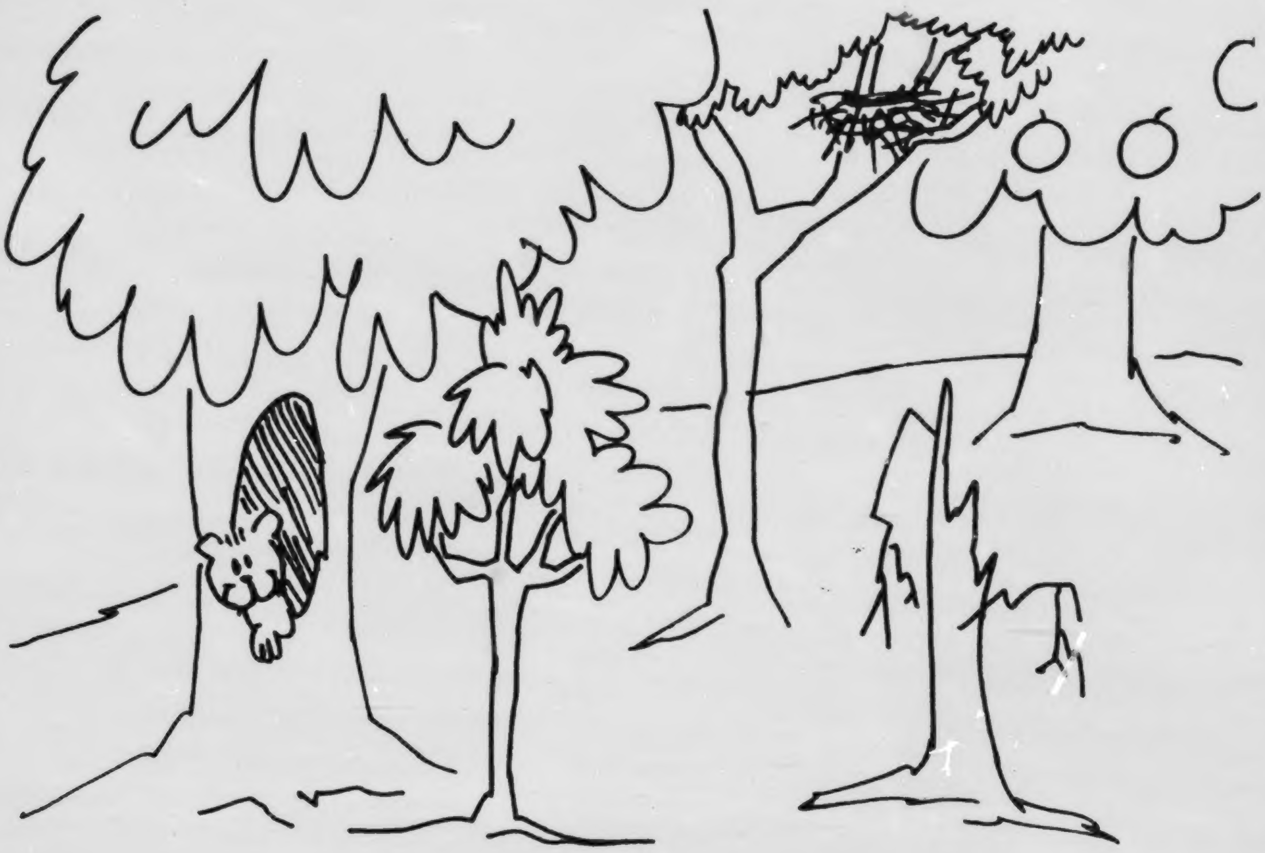

• LITTLE DANDY •
LUMBER MILL
2X4
2X10
4X4







Name ______________________________



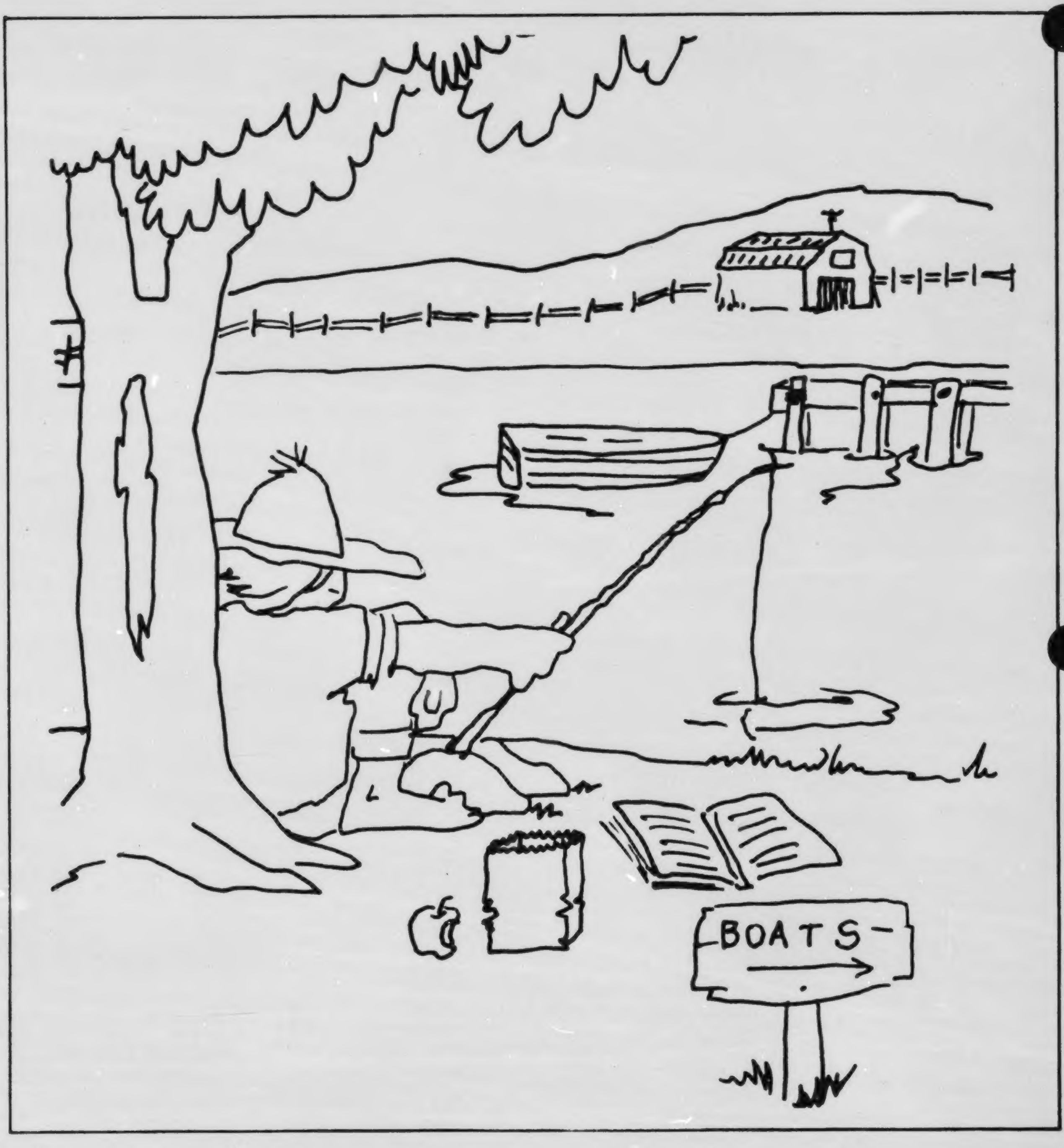
Put the numbers on the trees that the sentences tell about.

1. This tree is very big.
2. This tree is little.
3. There is a nest in this tree.
4. Someone lives inside this tree.
5. This tree gives us something to eat.
6. This tree is not alive.

Color the picture.

124

Name



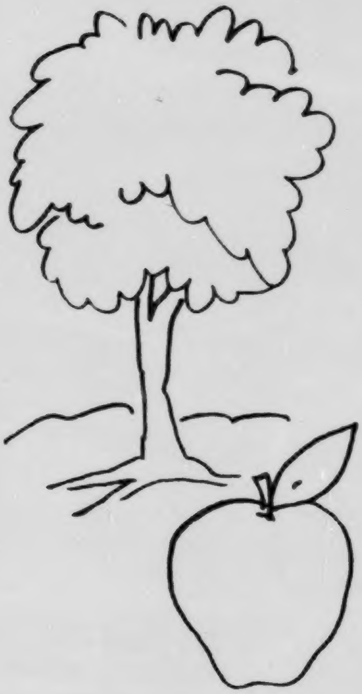
Trees give us many things.

Put an X on all the things in the picture that we can get from trees.

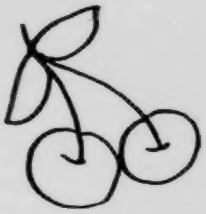
32

Name

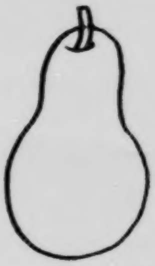
Many plants have fruit that we can eat.
These fruits grow on trees.
What color are they? Color them.



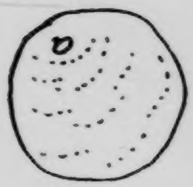
apple



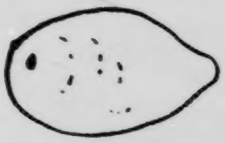
cherries



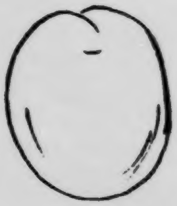
pear



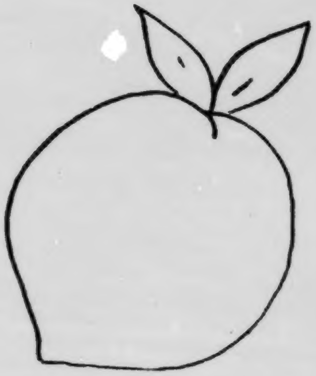
orange



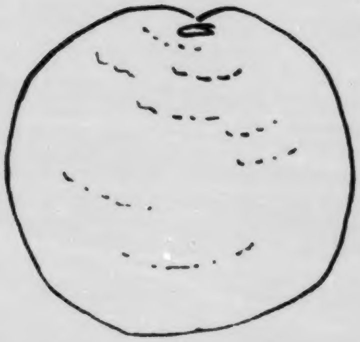
lemon



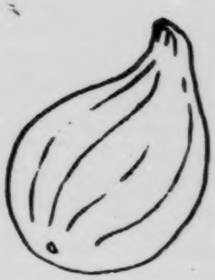
plum



peach

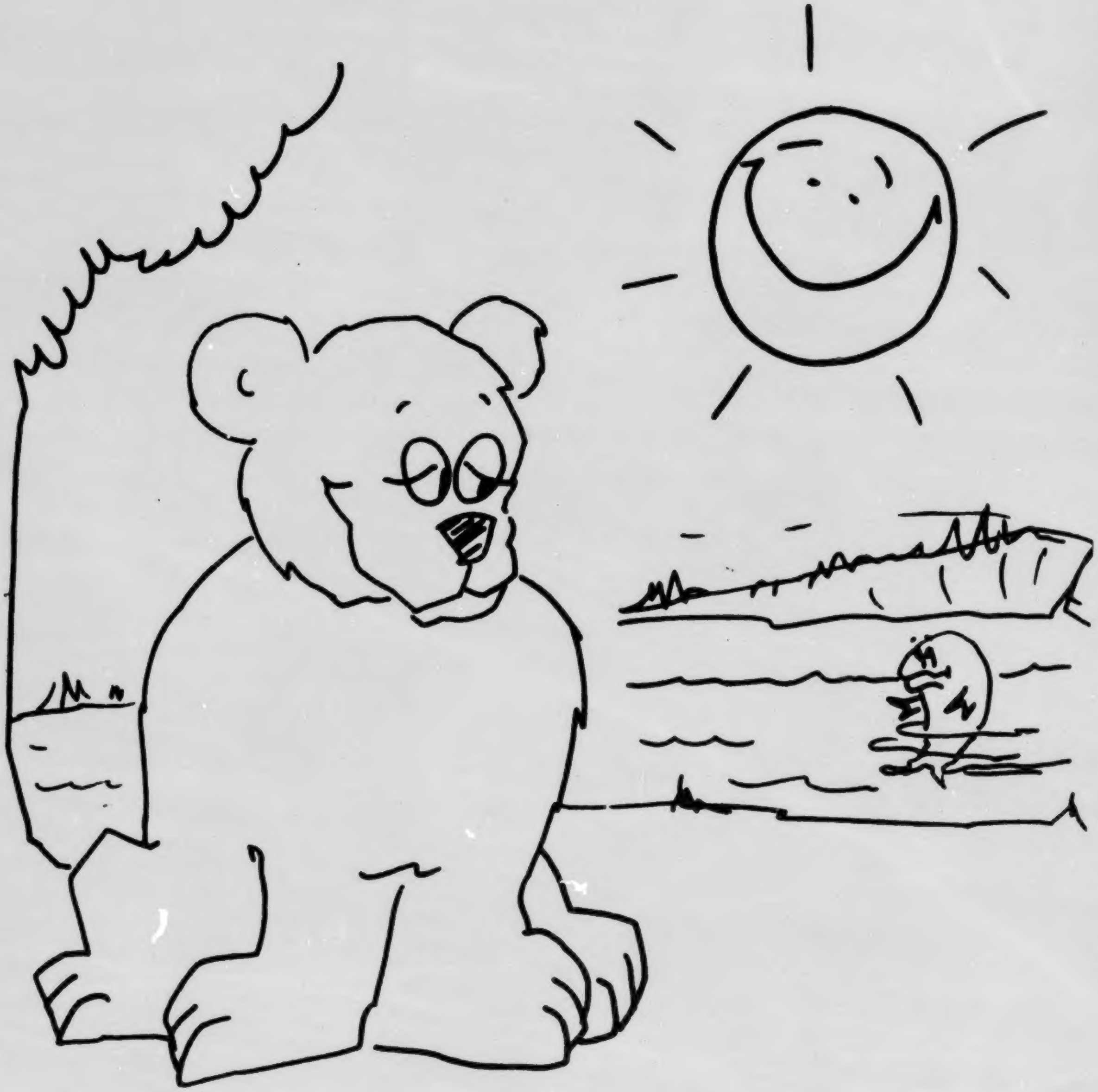


grapefruit



fig

Name ________________________________



All animals need air.
Do not color the air.

All animals need water.
Color the water blue.

All animals need soil.
Color the soil brown.

All animals need sun.
Color the sun yellow.

Make the bear any color you like.

Name

Animals help us in many ways.

Draw a line from the sentence to the picture it tells about.

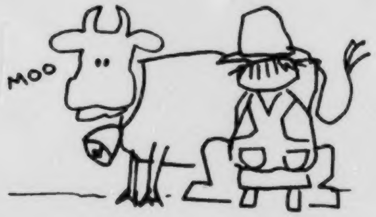
Animals can help us work.

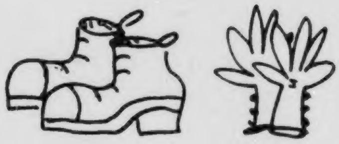
Some animals give us food.

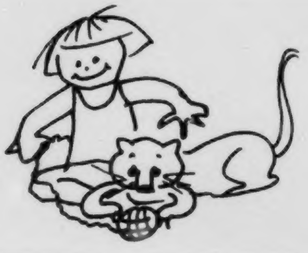
Animals also give us things to wear.

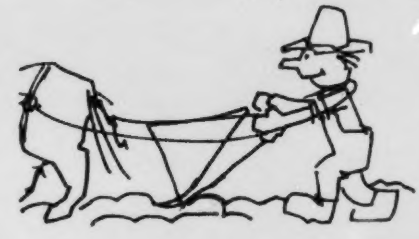
Many people have animals for pets.

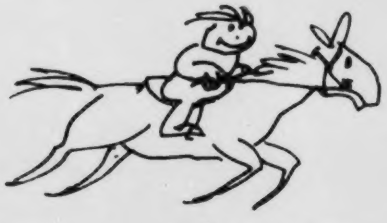
You can ride on some animals.







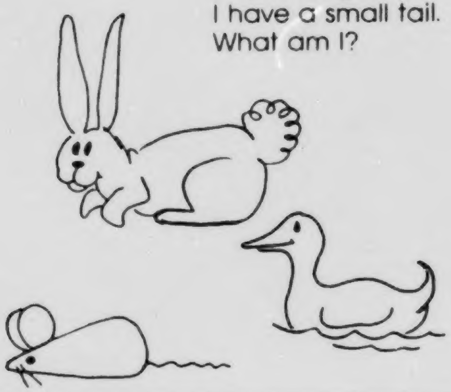




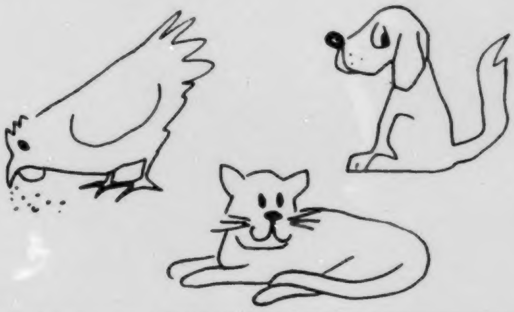
Name ______________________

Draw a circle around the right animal.

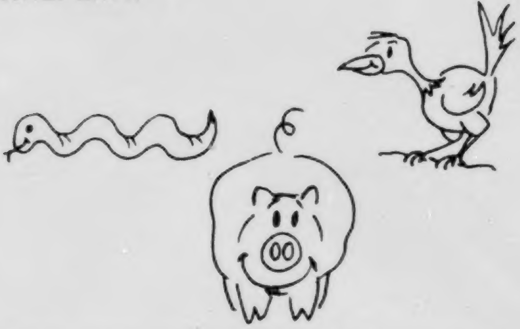
I am small and furry.
I have long ears.
I have a small tail.
What am I?



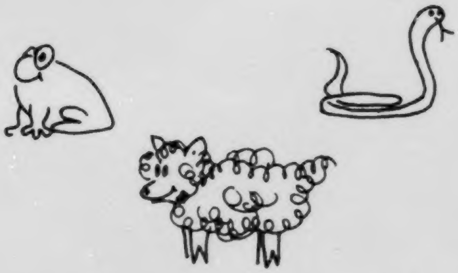
I am white.
I have feathers.
I lay eggs.
What am I?



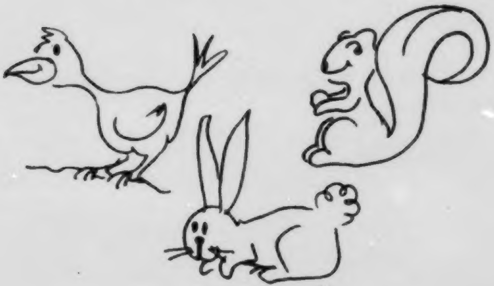
I am fat.
I have four legs.
I have a curly tail.
What am I?



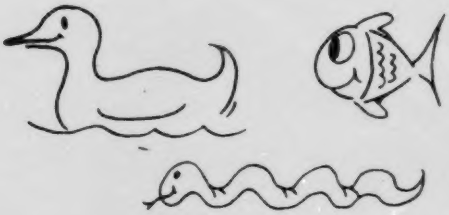
I do not have fur or feathers.
I am thin and long.
I do not have legs.
What am I?



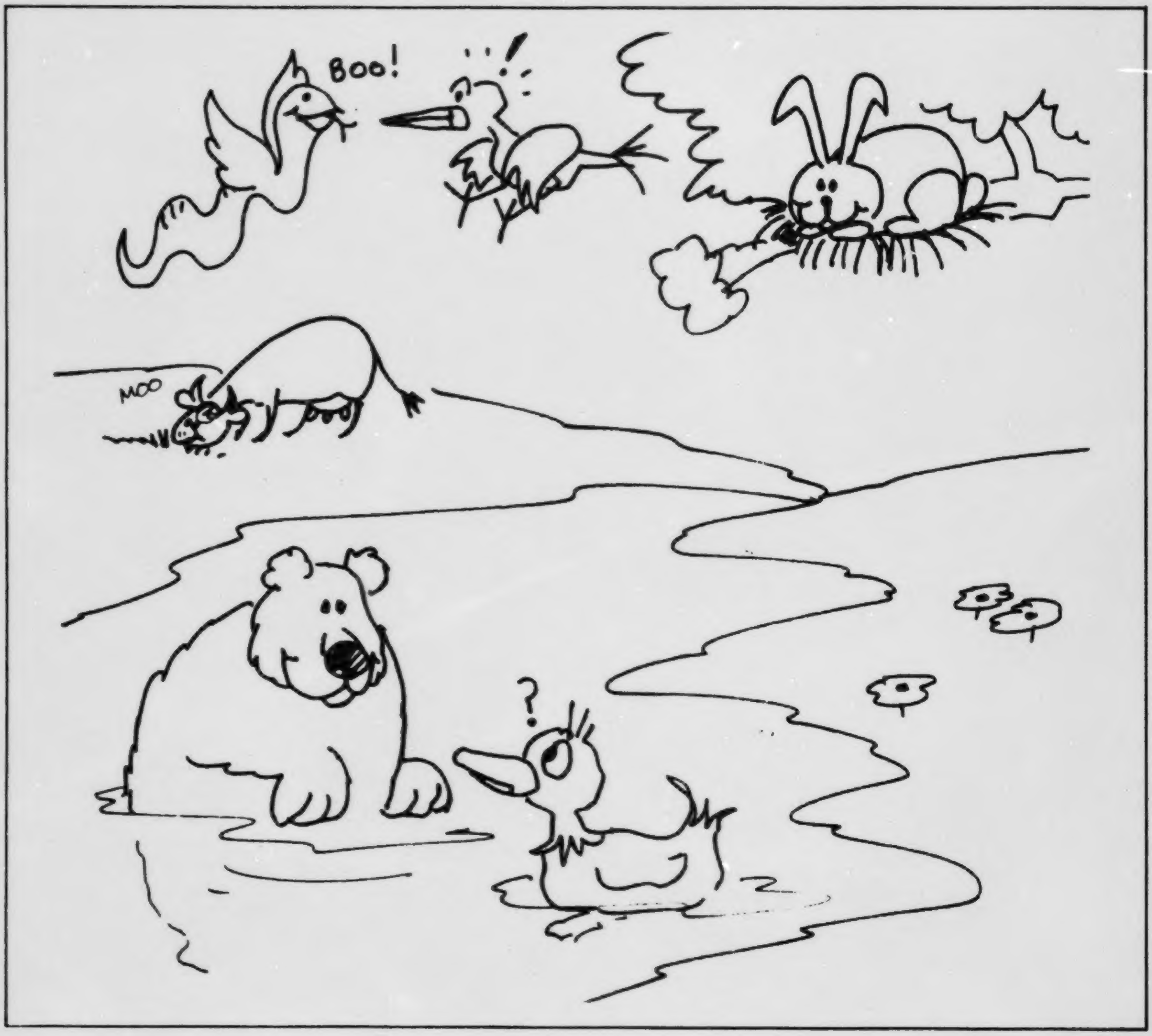
I can live in a tree.
I have a big furry tail.
I like to eat seeds.
What am I?



I like to swim in the water.
I can lay eggs, too.
I have feathers.
What am I?



Name



Each animal has its own habitat, or place where it lives best.

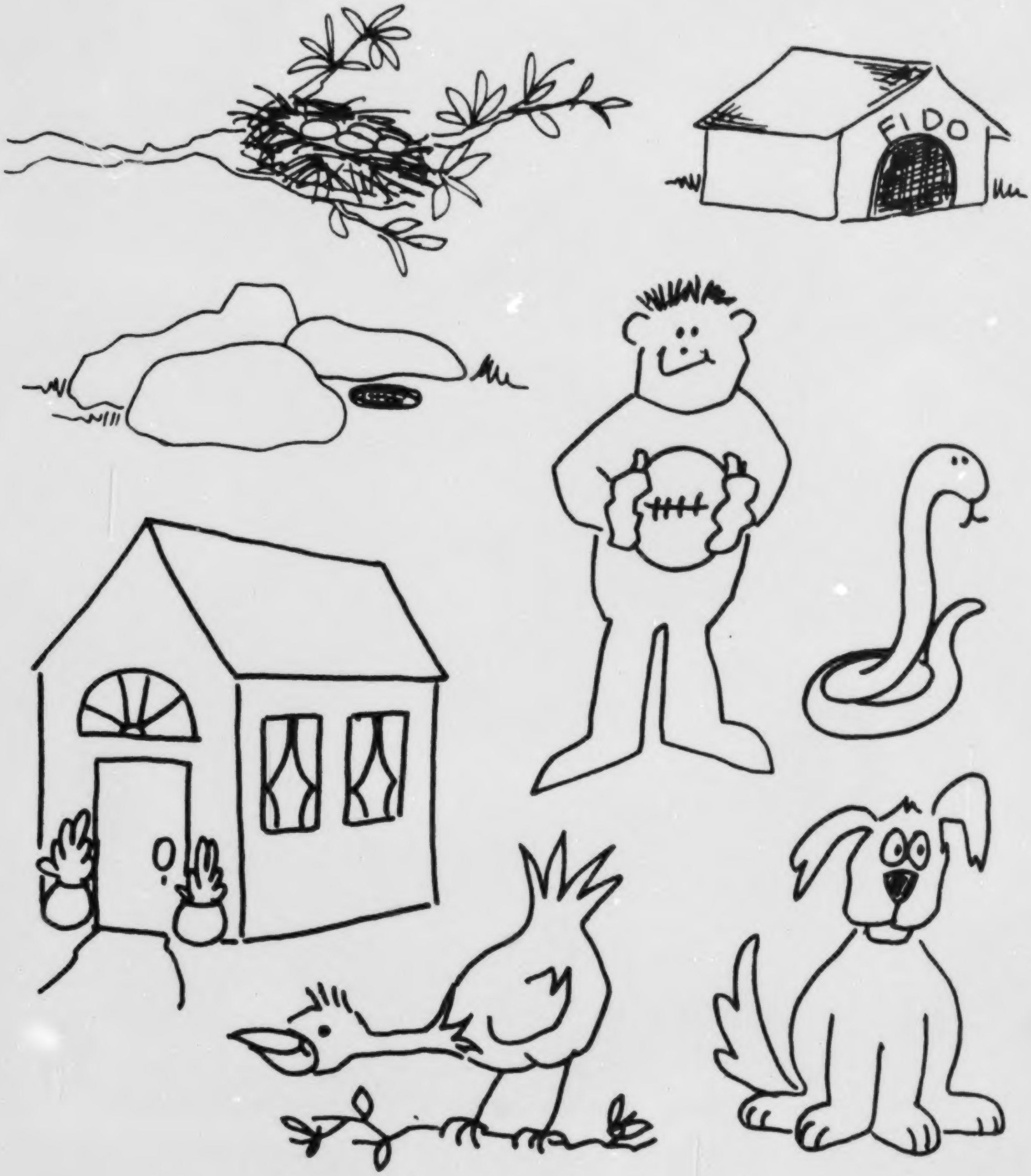
Three of these animals are in the wrong places. Put an X on the ones that are not in their own habitats.

Color the picture.

Name

Habitat: Natural home of the animal.

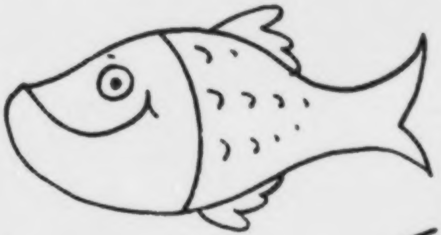
Draw a line from each animal to its habitat.

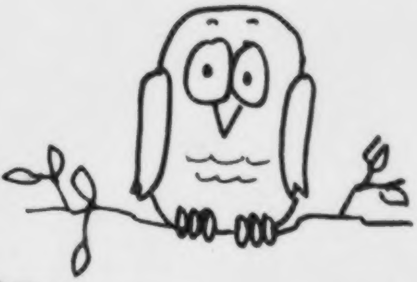


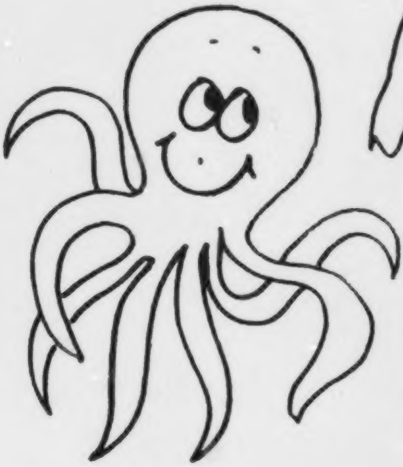
Name ______________________________

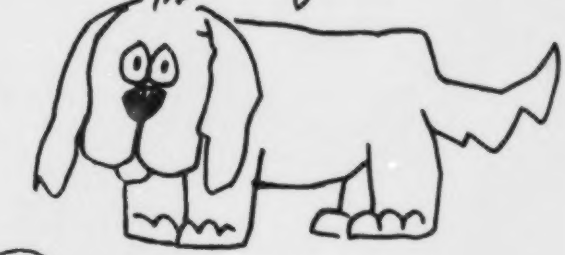
We need water to drink. But we could not live in water. Water is a good home for many plants and animals.

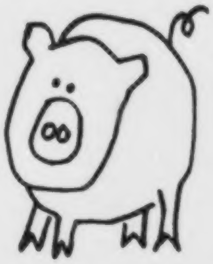
Some of these animals live in water. Color the ones that do live in water. Put an X on the ones who do not live in water.

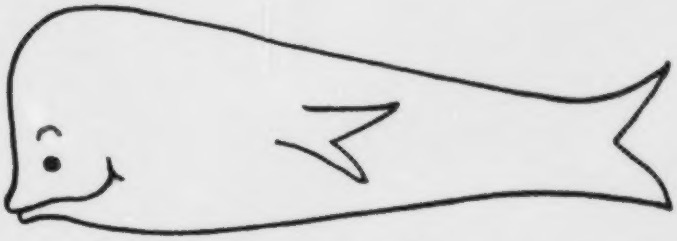


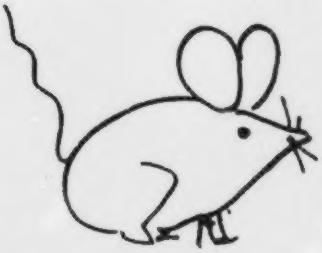


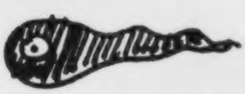






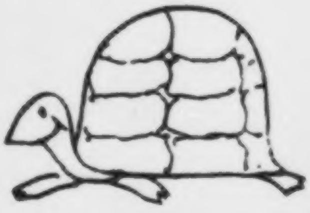


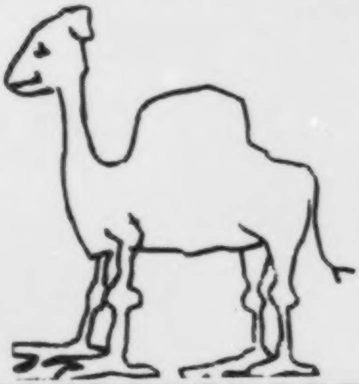


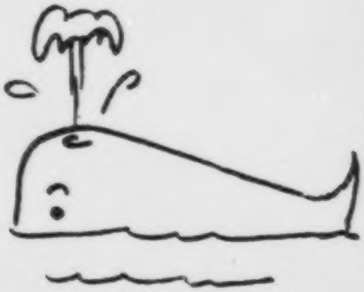


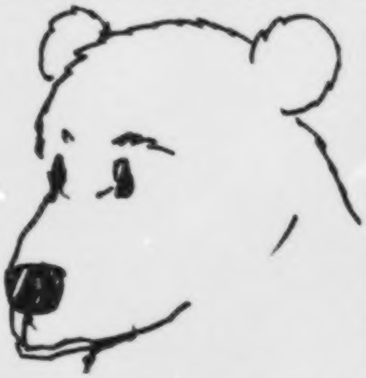
Name

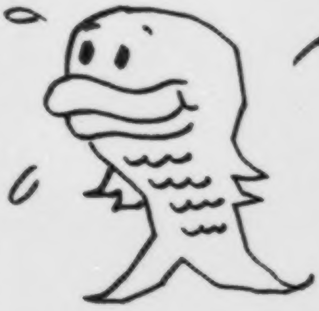
Cut out the animal pictures. Paste them in the correct environment.

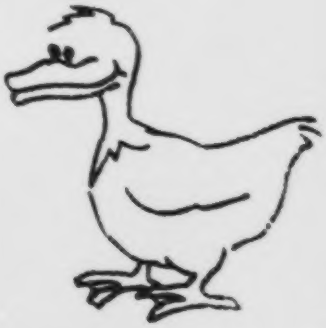


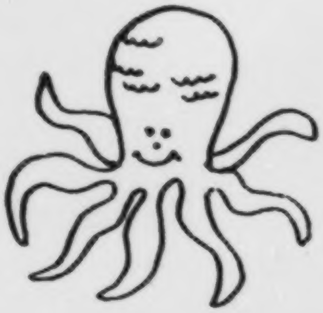


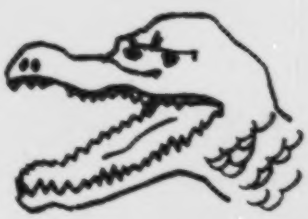


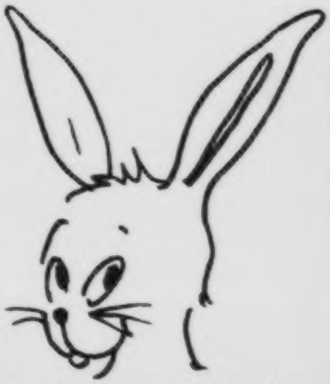












Name

Environments

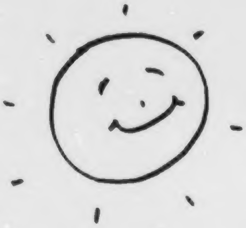
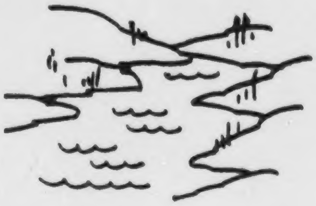
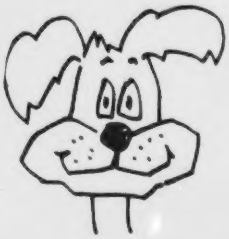
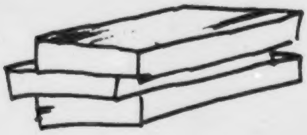
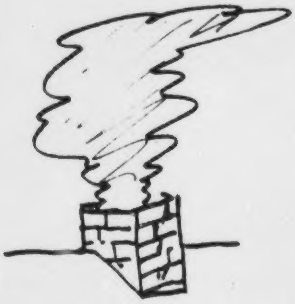
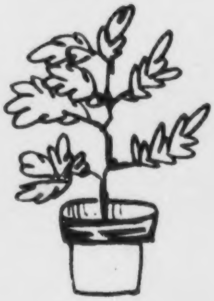
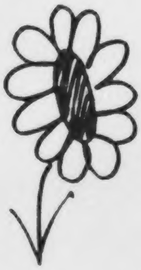
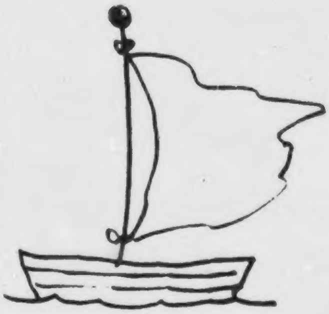
Water

Land

Water and Land

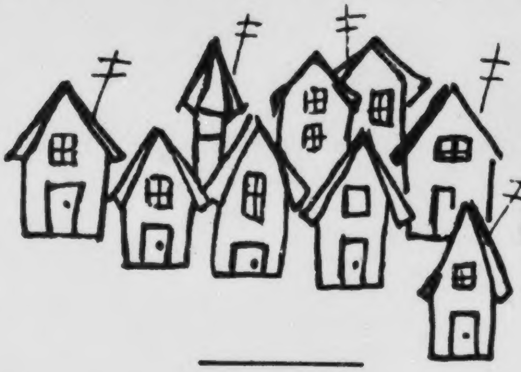
Name ______________________________

Mark the circle in front of the correct word.

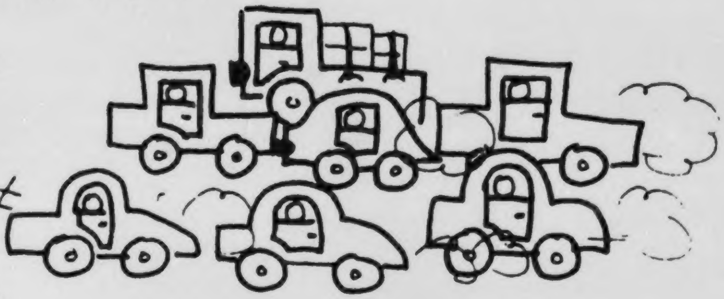
 ○ set ○ sun ○ saw	 ○ work ○ water ○ blue
 ○ animal ○ people ○ house	 ○ window ○ wind ○ wood
 ○ smoke ○ small ○ snake	 ○ plate ○ pail ○ plant
 ○ flower ○ fun ○ flag	 ○ stop ○ shoe ○ sail

Name ______________________

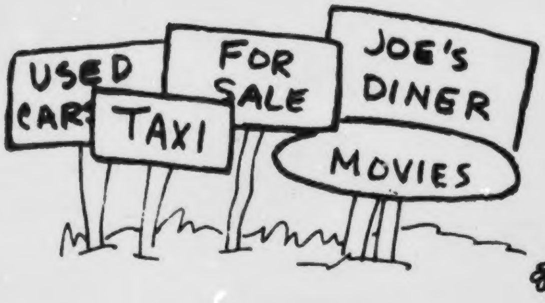
When the air, soil and water are dirty,
we say they are polluted.
Here are some kinds of pollution.



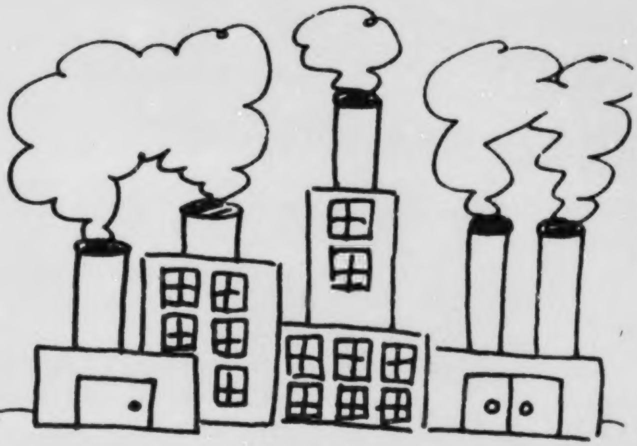
______



______


USED CARS
FOR SALE
JOE'S DINER
TAXI
MOVIES

______

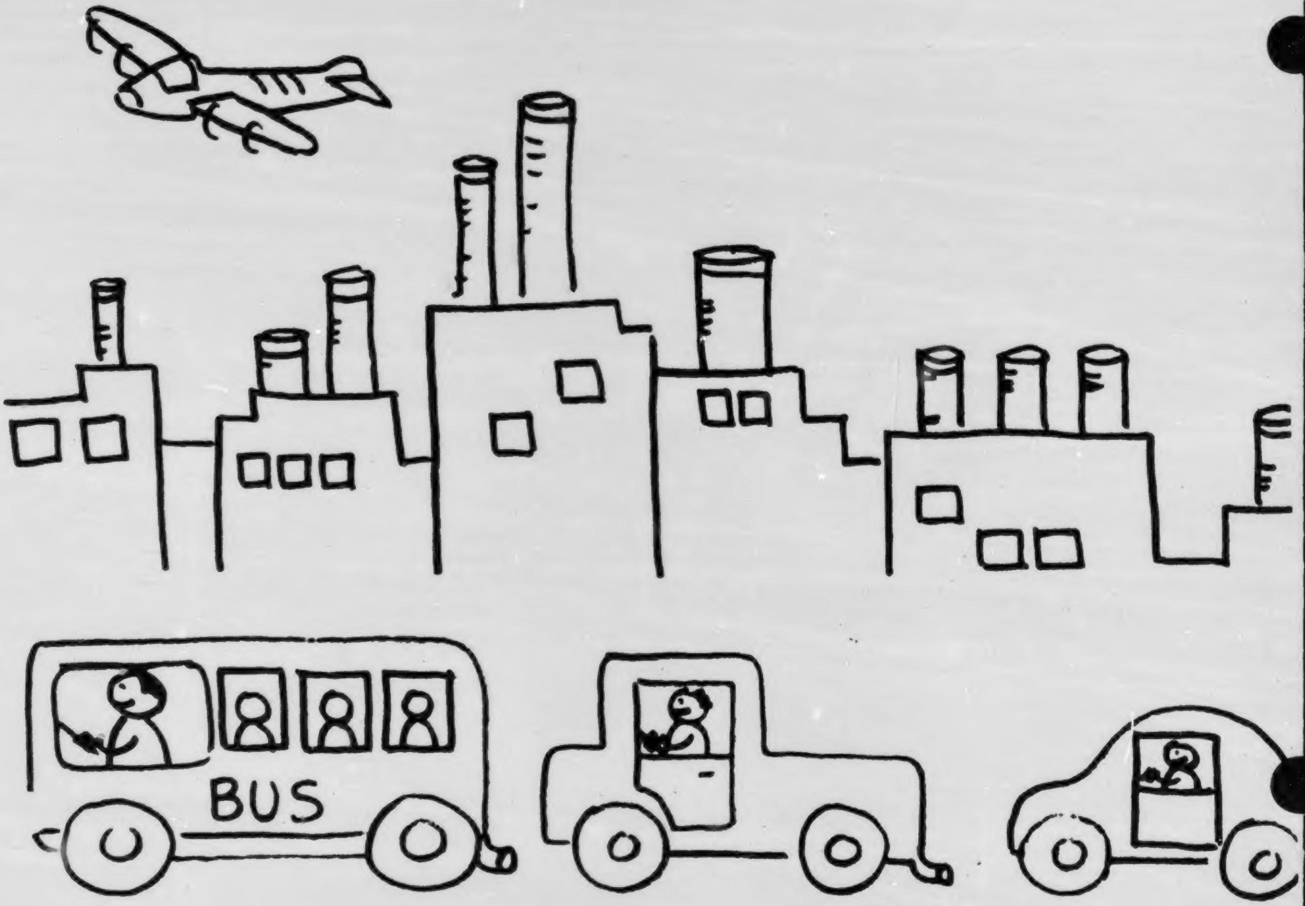


______

Read the sentences. Write the numeral under the right picture.

1. This shows too many cars.
2. This is how factories pollute our air.
3. This shows too many houses.
4. This is not nice to look at.

Name ________________________________



☐ Make smoke coming from all the chimneys.

☐ Put smoke coming out of the vehicles.

☐ Color the bus yellow.

☐ Make the truck red.

☐ Color the plane blue.

☐ Draw smoke coming from the plane.

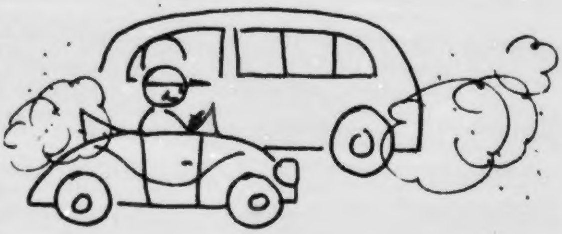
☐ What color will the sky be?
Color it.

Name ______________________________

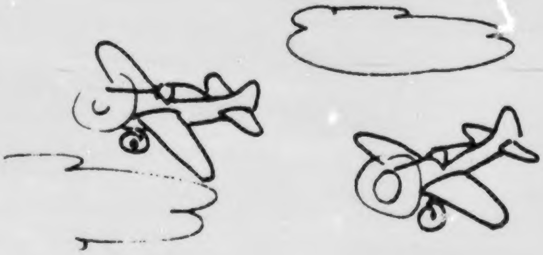
Here are some things that can make the air dirty.

Directions:
Write the words under the correct picture.

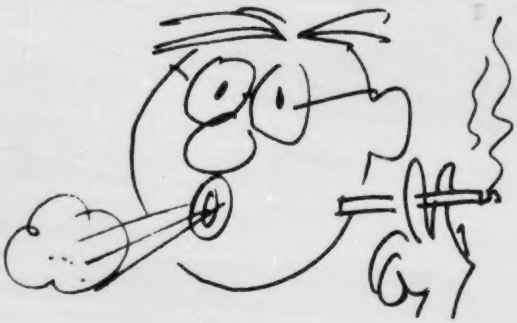
trash	cars	airplanes
smoke	fires	smoking



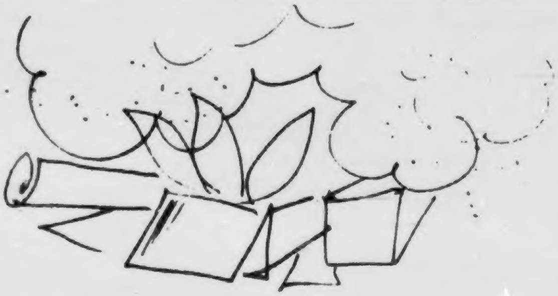
_ _ _ _



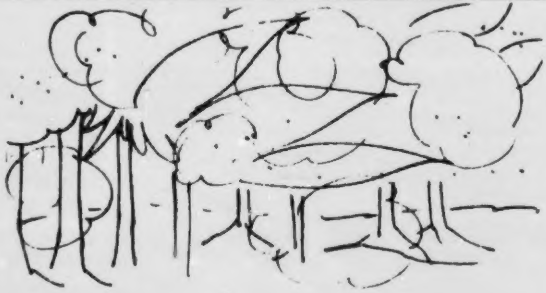
_ _ _ _ _ _ _ _ _



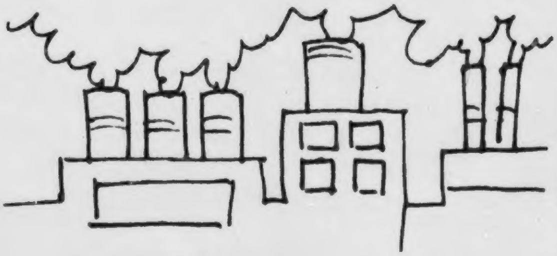
_ _ _ _ _ _ _



burning _ _ _ _ _



forest _ _ _ _ _

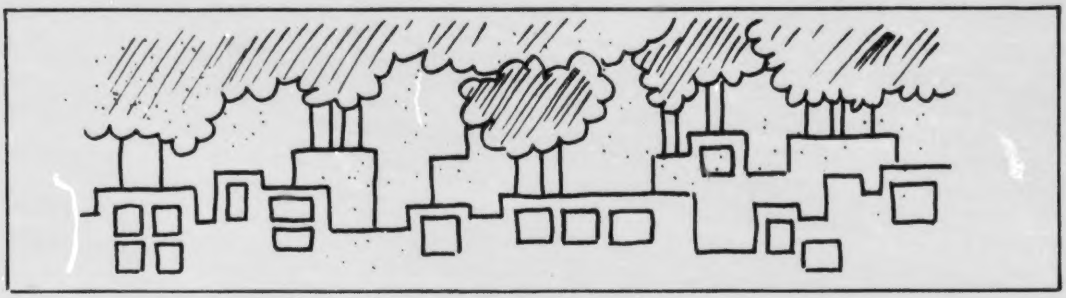


_ _ _ _ _ from factories

Name ________________________

Draw a line under the sentence that tells about the picture.

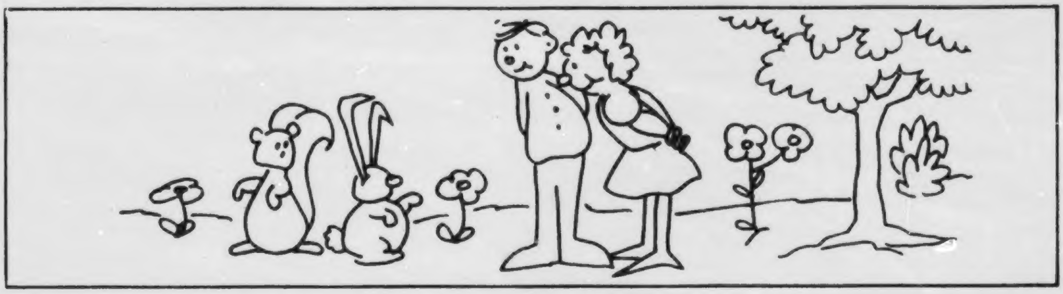
1.



Fire is bad for plants.

Smoke makes the air dirty.

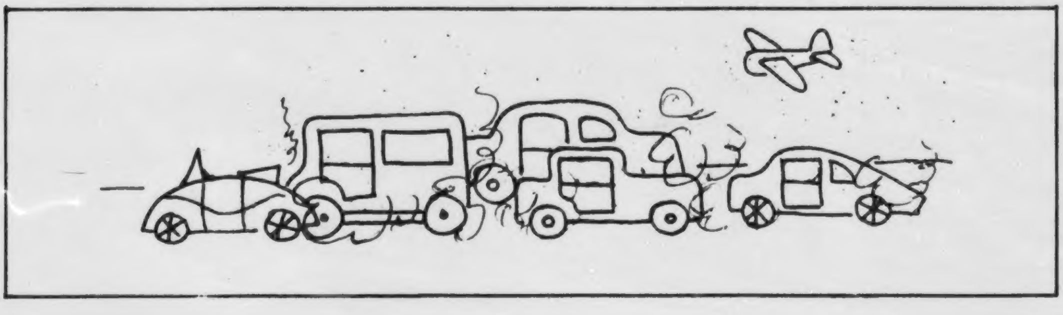
2.



All living things need air.

Bears are big animals.

3.



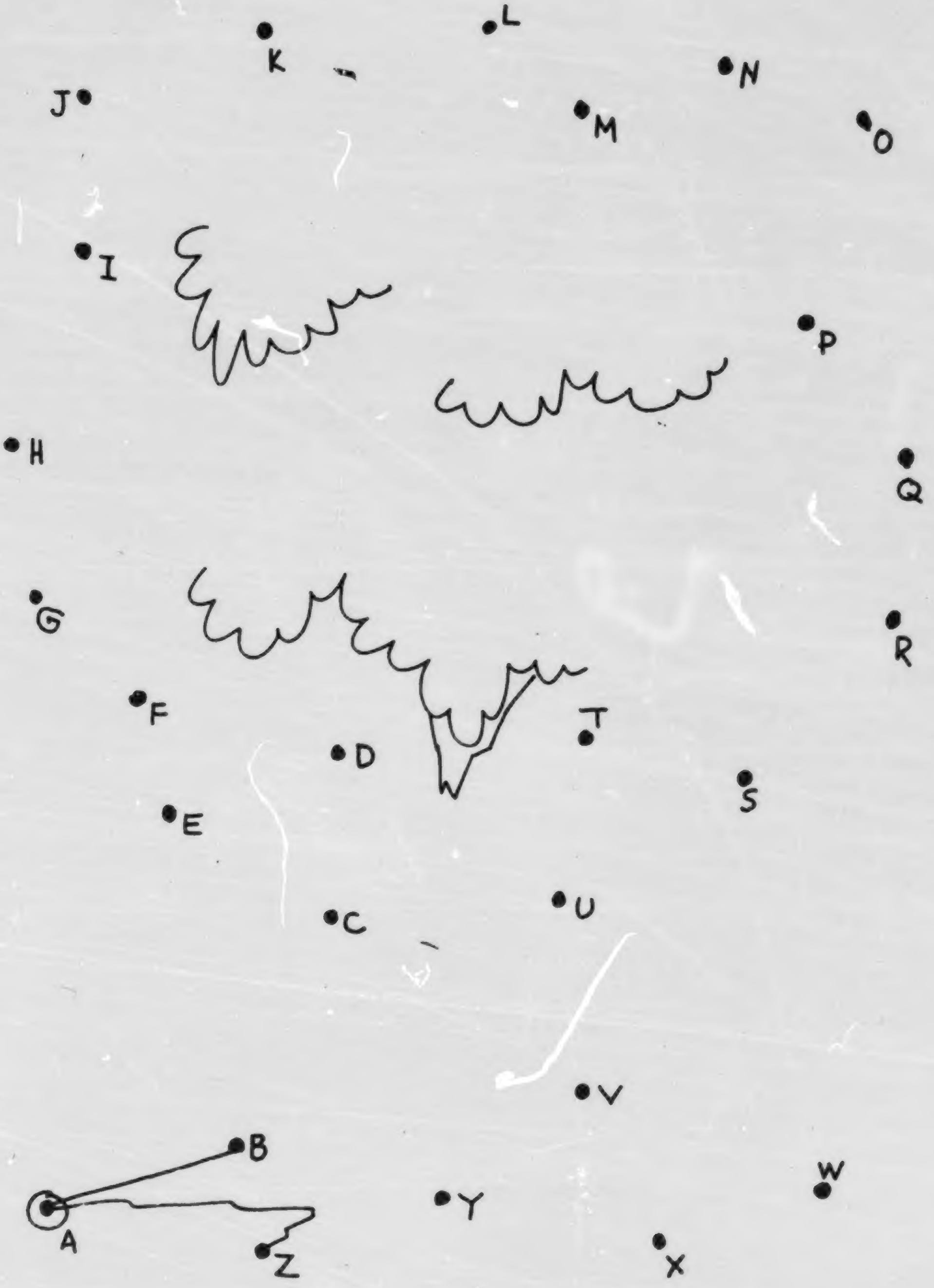
We like to ride in cars and airplanes.

Cars and airplanes make the air dirty, too.

46

Name

Connect the dots to see what gives us clean air to breathe.


A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Name

Write the letter that comes next.

A B C ___
L M N ___
K L M ___'
Q R S ___

– – A ___
B C D ___

A

I J K ___
F G H ___
Q R S ___
Q R S ___
B C D ___
O P Q ___
– – A ___
R S T ___
D E F ___!

Can you read the message?

HEE
HEE
COLA
BEAN

Name ______________________

If you don't want to be a litterbug, where should you put your paper wrappers?

Fill in the missing letters to find out.

G H ___ J K
L M ___ O P
R S ___ U V
F G ___ I J
C D ___ F G
R S ___ U V
P Q ___ S T
___ B C
Q R ___ T U
F G ___ I J
A B ___ D E
___ B C
L M ___ O P

Write the letters that you wrote on the spaces below.

__ ___ _____ ___

Name

Draw a circle around the word that does not belong in the sentence.

1. All living things need we water.
2. Dirty water is not need good.
3. It clean can make you sick.
4. Keep our water water clean.

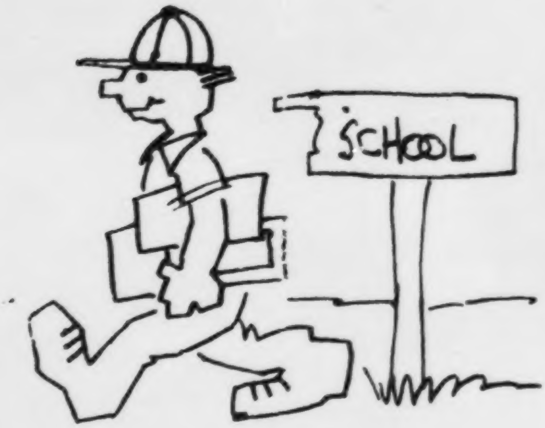
Write the words that you circled in the boxes.

1. 2. 3. 4.

Name

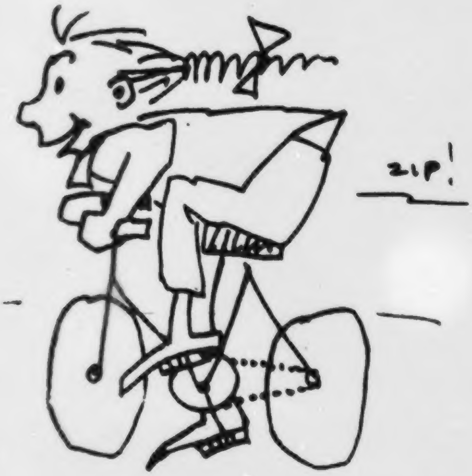
Draw a line under the correct word in each sentence.

Dan and Sue are
helping
helpping
to keep the air clean.

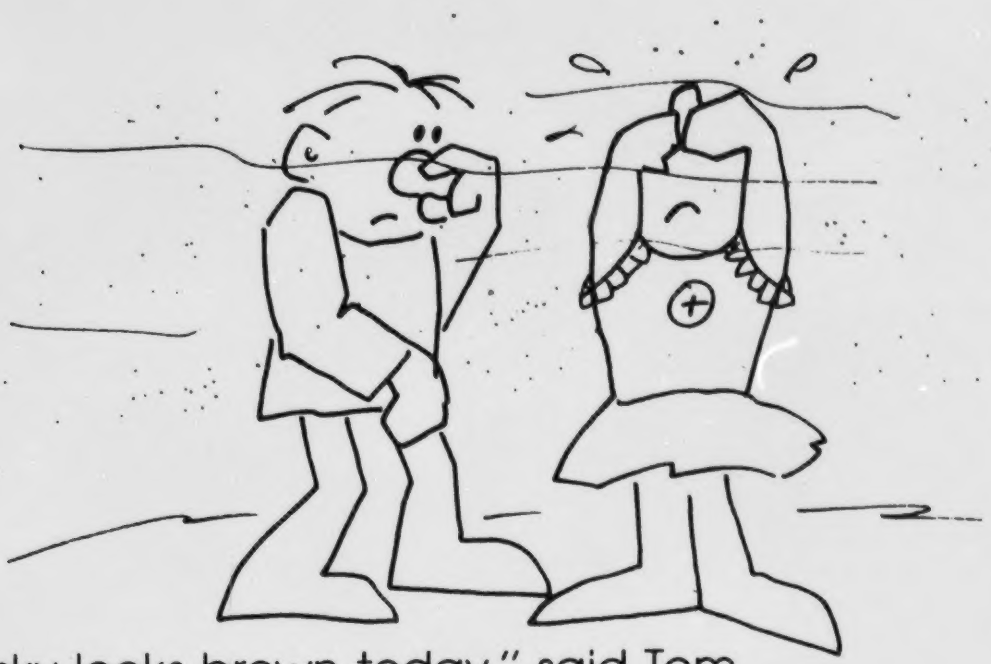


Dan walks
wolks
to school.

Sue rids a
rides
bike to school.



Name ______________________



"The sky looks brown today," said Tom.
"What is making the air so dirty?" asked Jane.
"Too many cars are putting smoke into the air," said Tom.
"I wish there were not so many cars," said Jane. "Then the air would be cleaner."

Answer the questions.

What color was the sky?

○ blue

○ brown

○ white

What made the air dirty?

○ too many cars

○ too many dogs

○ Tom and Jane

What did Jane want?

○ the air to be dirty

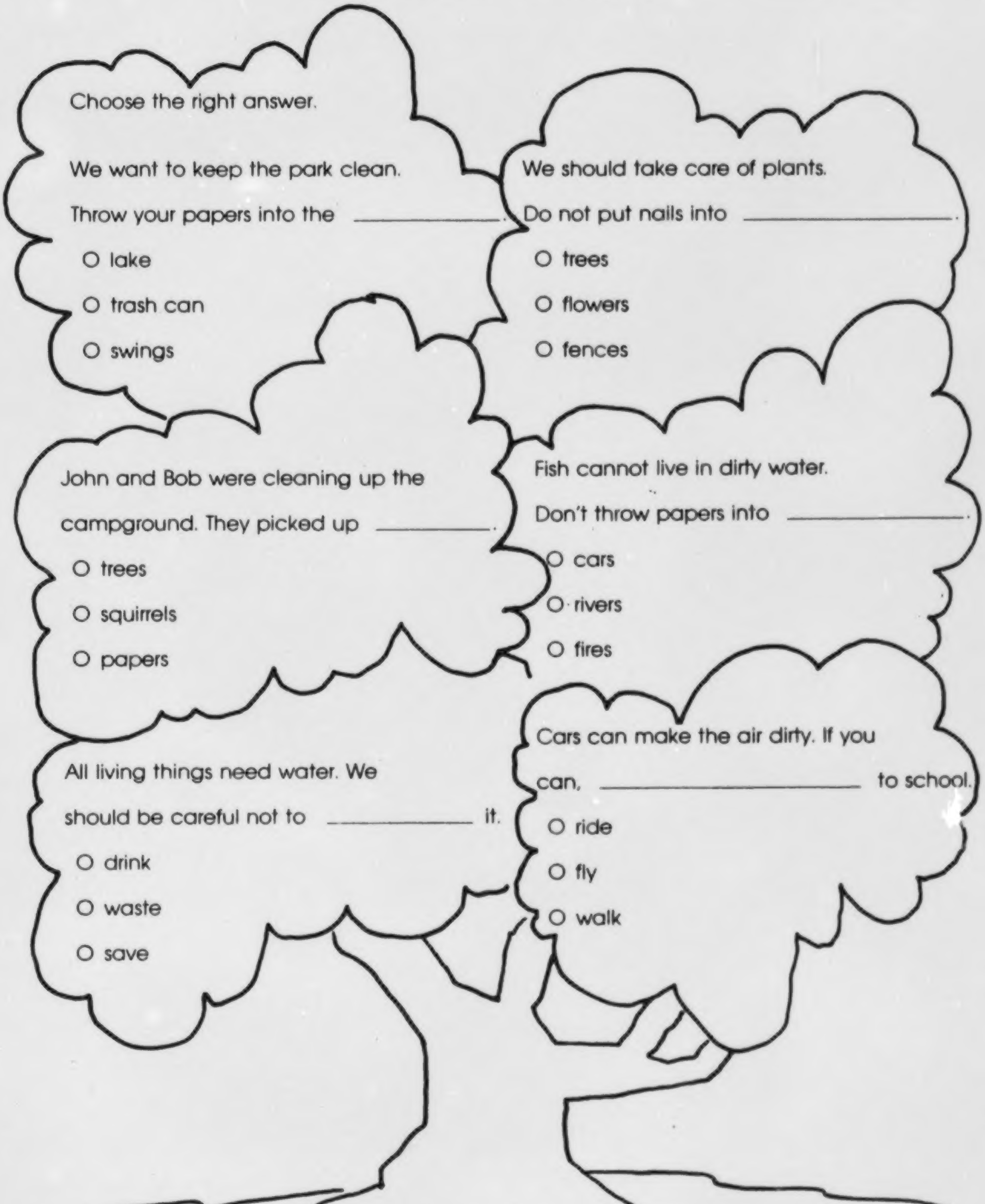
○ more cars

○ the air to be cleaner

Name ______________________________

- -

____



Choose the right answer.

We want to keep the park clean.

Throw your papers into the ____________.

○ lake

○ trash can

○ swings

We should take care of plants.

Do not put nails into ____________.

○ trees

○ flowers

○ fences

John and Bob were cleaning up the campground. They picked up ____________.

○ trees

○ squirrels

○ papers

Fish cannot live in dirty water.

Don't throw papers into ____________.

○ cars

○ rivers

○ fires

All living things need water. We should be careful not to ____________ it.

○ drink

○ waste

○ save

Cars can make the air dirty. If you can, ____________ to school.

○ ride

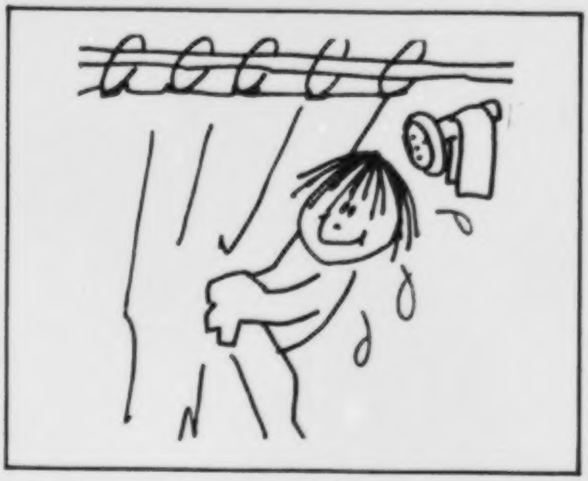
○ fly

○ walk

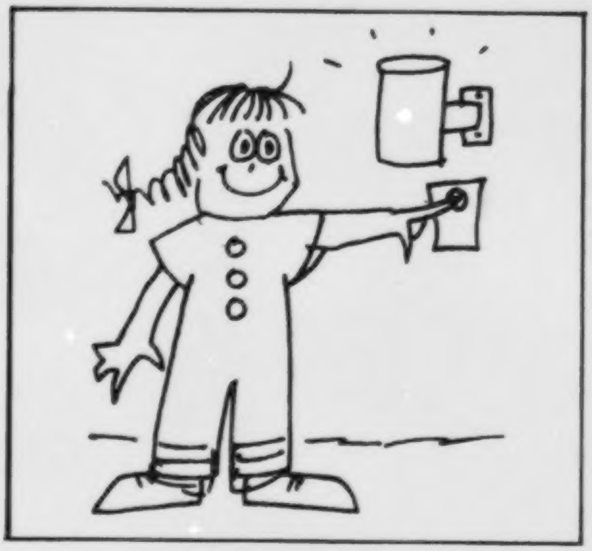
Name ______________________________

Here are some ways you can help our environment.

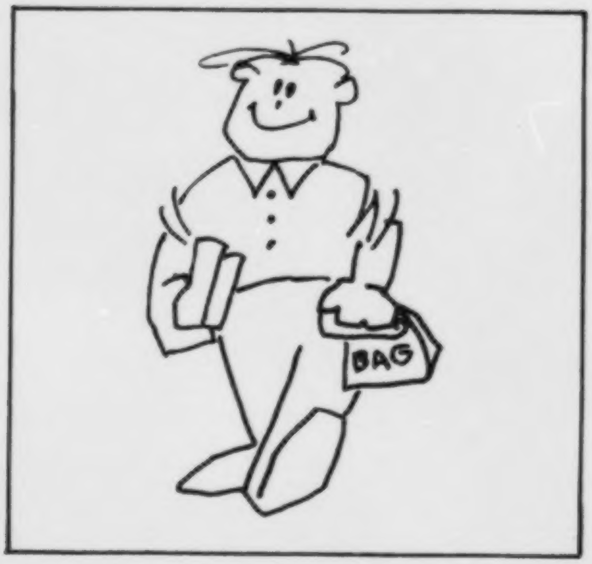
Put a mark in the circle in front of the best word.



Taking a ○ short / ○ long shower will save water.



Turning ○ on / ○ off the lights when you leave the room will save energy.

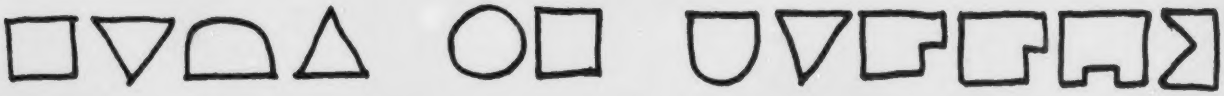


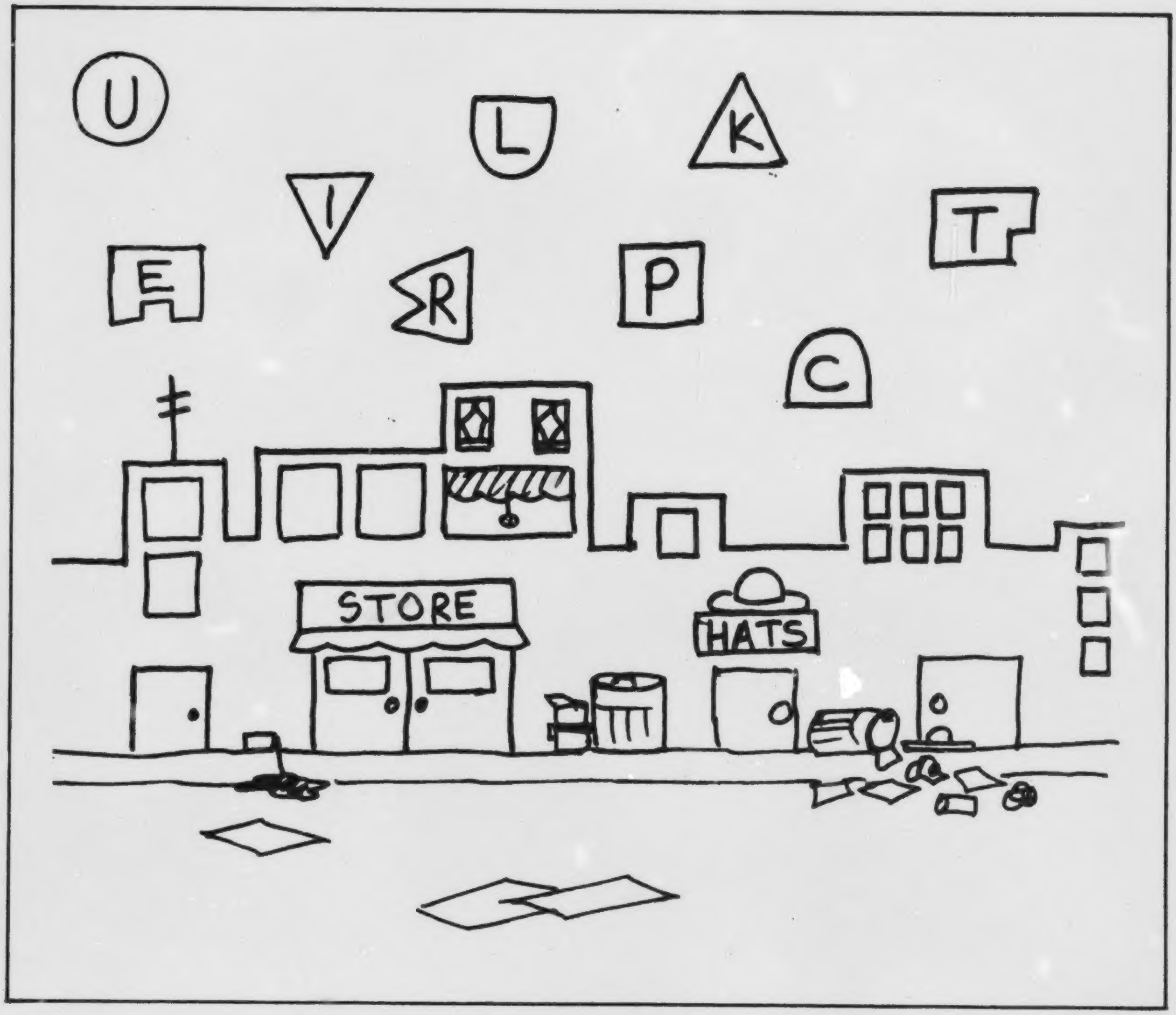
○ Walking / ○ Riding to school will save gas.

Name

How can we help to stop pollution?

Put the right letter into the right shape to find out.




U
L
K
I
T
E
R
P
C
STORE
HATS

Name

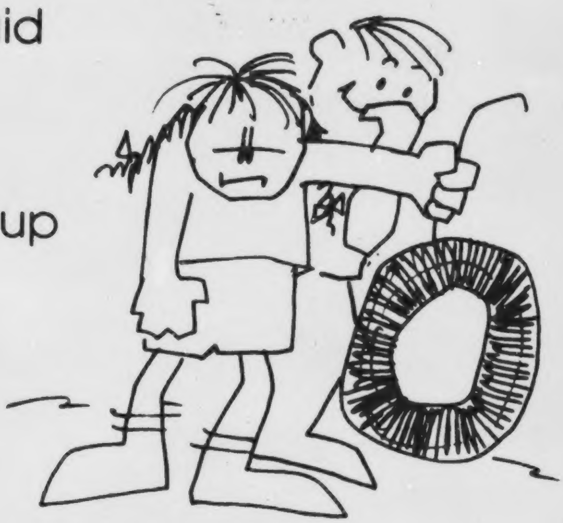
Sue and Billy went fishing. They sat in the shade under a big, green tree.

"I think I have a big fish!" said Sue.

"Pull it in," said Billy.

She pulled and pulled and up came a big, black tire.

"Oh no," cried Sue.



Answer the questions.

Sue and Billy went
- ○ to the store.
- ○ fishing.
- ○ to get a tire.

Sue pulled in a
- ○ big fish.
- ○ big, black tire.
- ○ big, green tire.

Sue wanted to catch a
- ○ big fish.
- ○ big, black tire.
- ○ big, green tree.

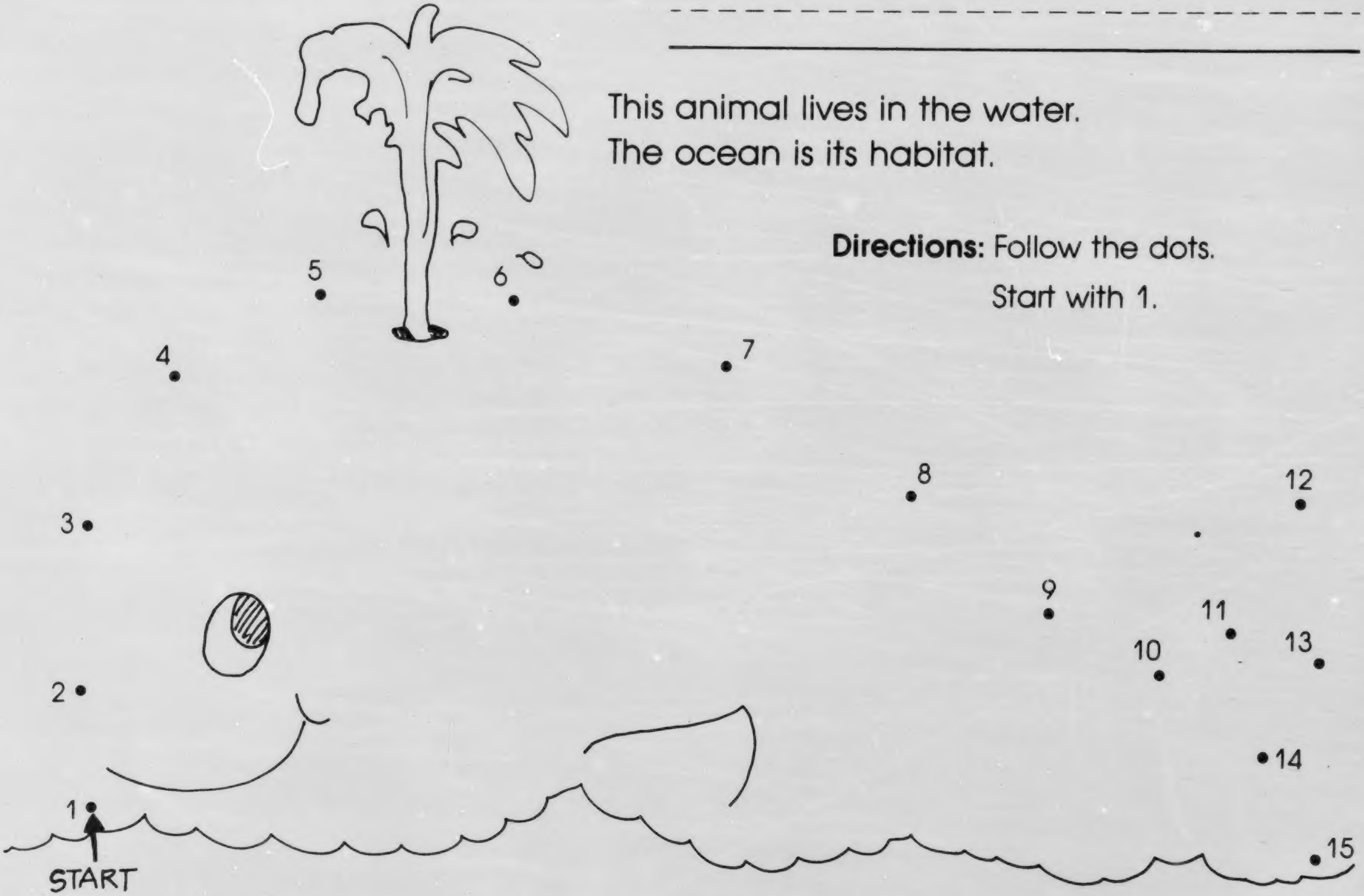
How did Sue probably feel?
- ○ She was happy.
- ○ She was afraid.
- ○ She was sad.

How did the tire probably get into the water?
- ○ It grew there.
- ○ The fish put it there.
- ○ Someone threw it in the water.

Name ______________________________

This animal lives in the water.
The ocean is its habitat.

Directions: Follow the dots.
Start with 1.



1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
START

Name ______________________________

Plants are living things.

Directions: Draw a line from the numeral to the group that matches.

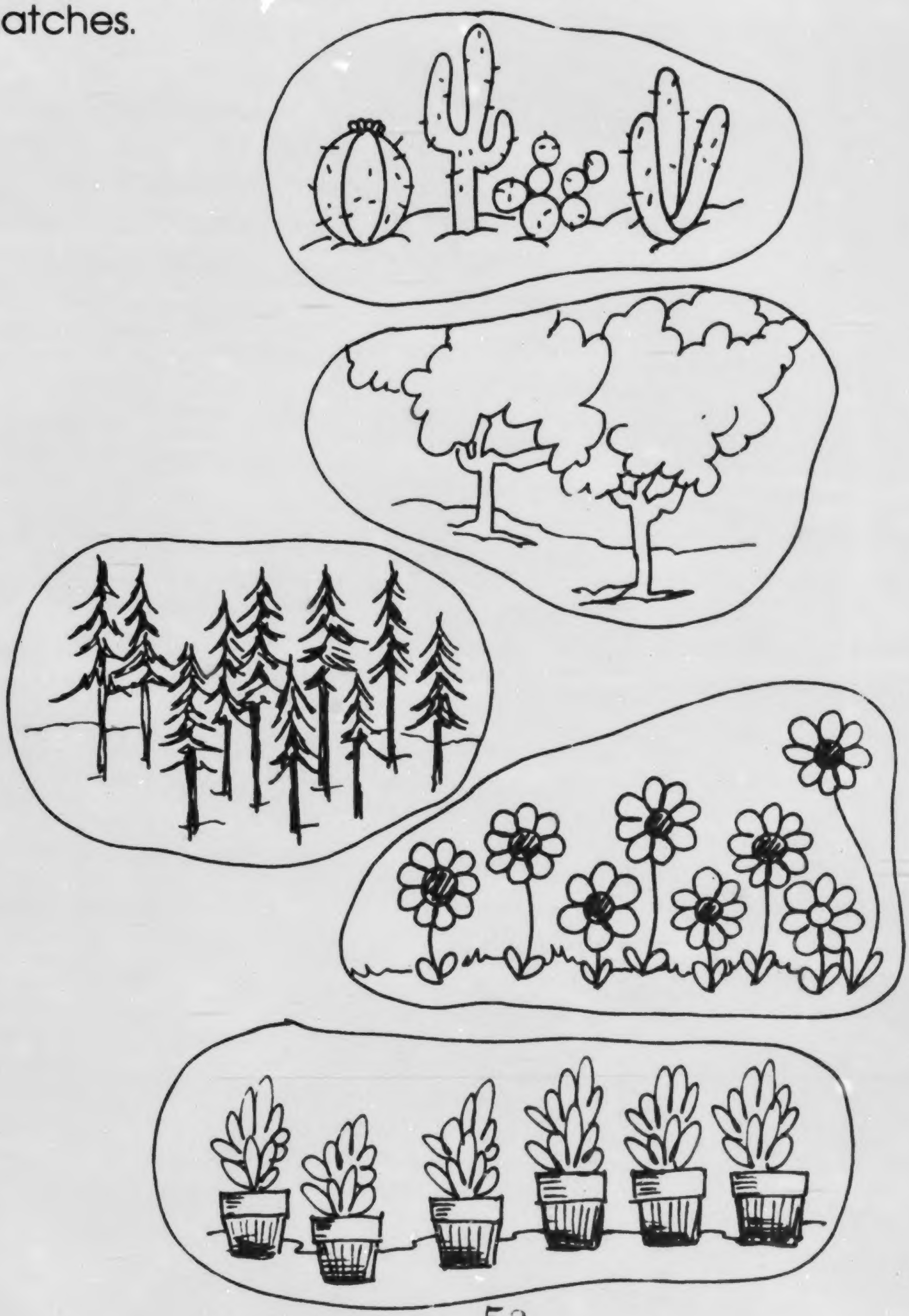
2

4

6

8

10

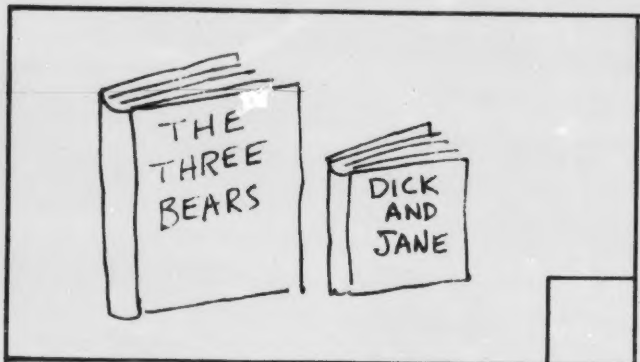


Name

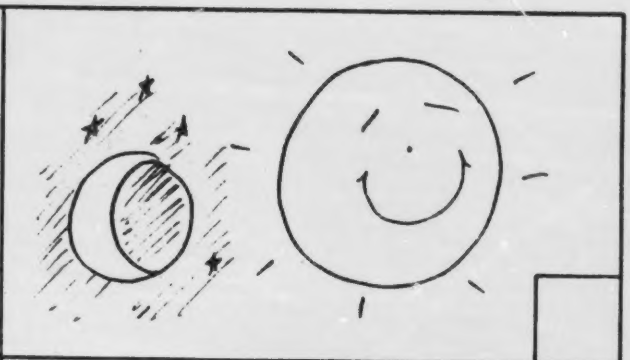
Directions:

Circle the smaller one.

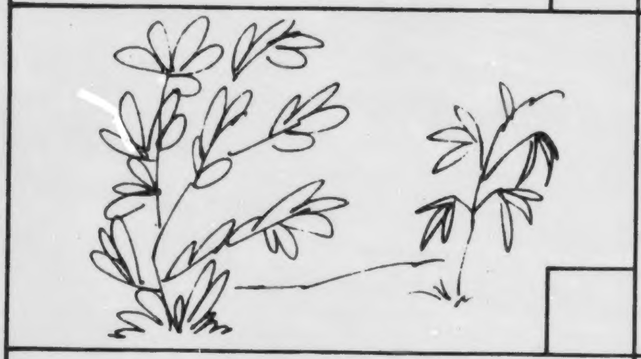
Put an X in the ☐ if the things are living.


THE THREE BEARS
DICK AND JANE

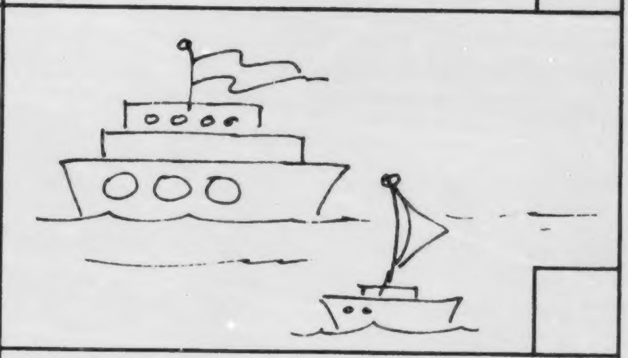
☐



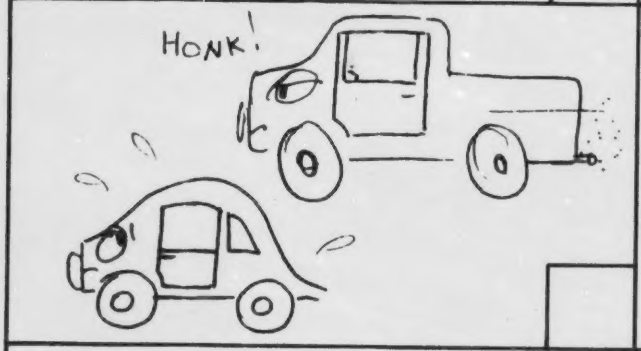
☐



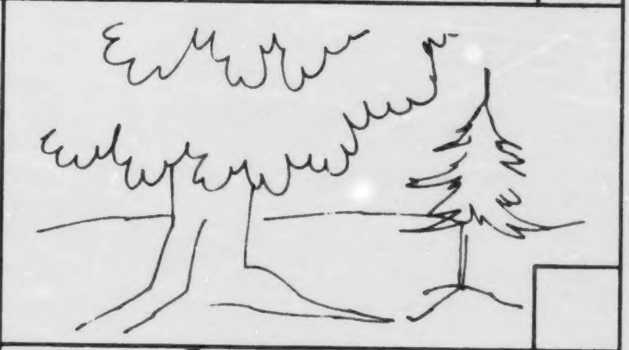
☐



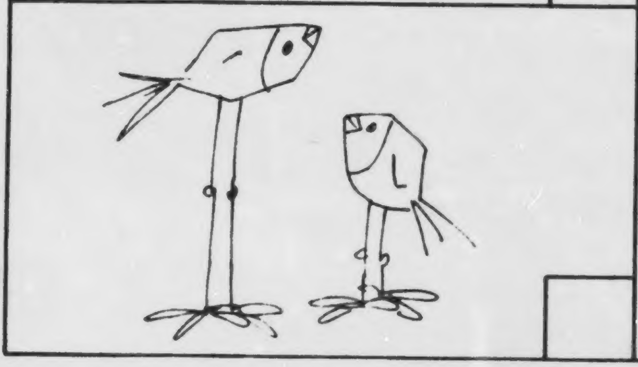
☐



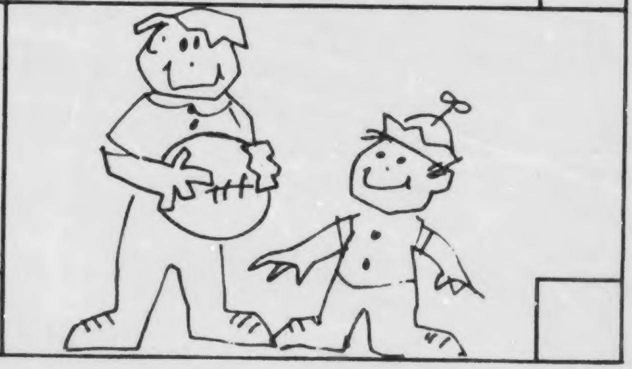
☐



☐



☐

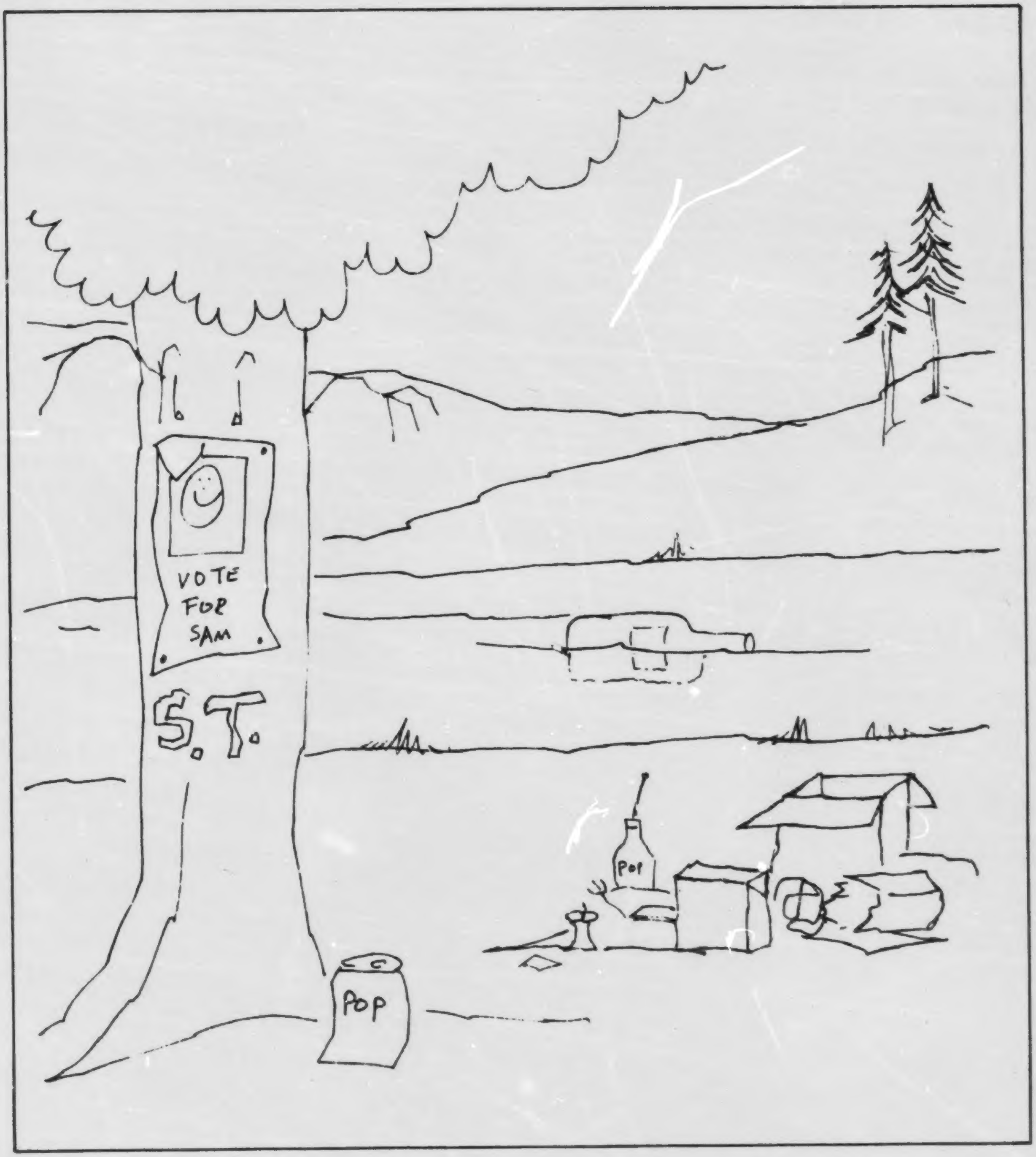


☐

Name ______________________________

This playground is not very pretty.

Directions:
Put an X on the things that do not belong there. Can you find all 5?


VOTE FOR SAM
S.T.
POP
POP

Name

Trees are living things.

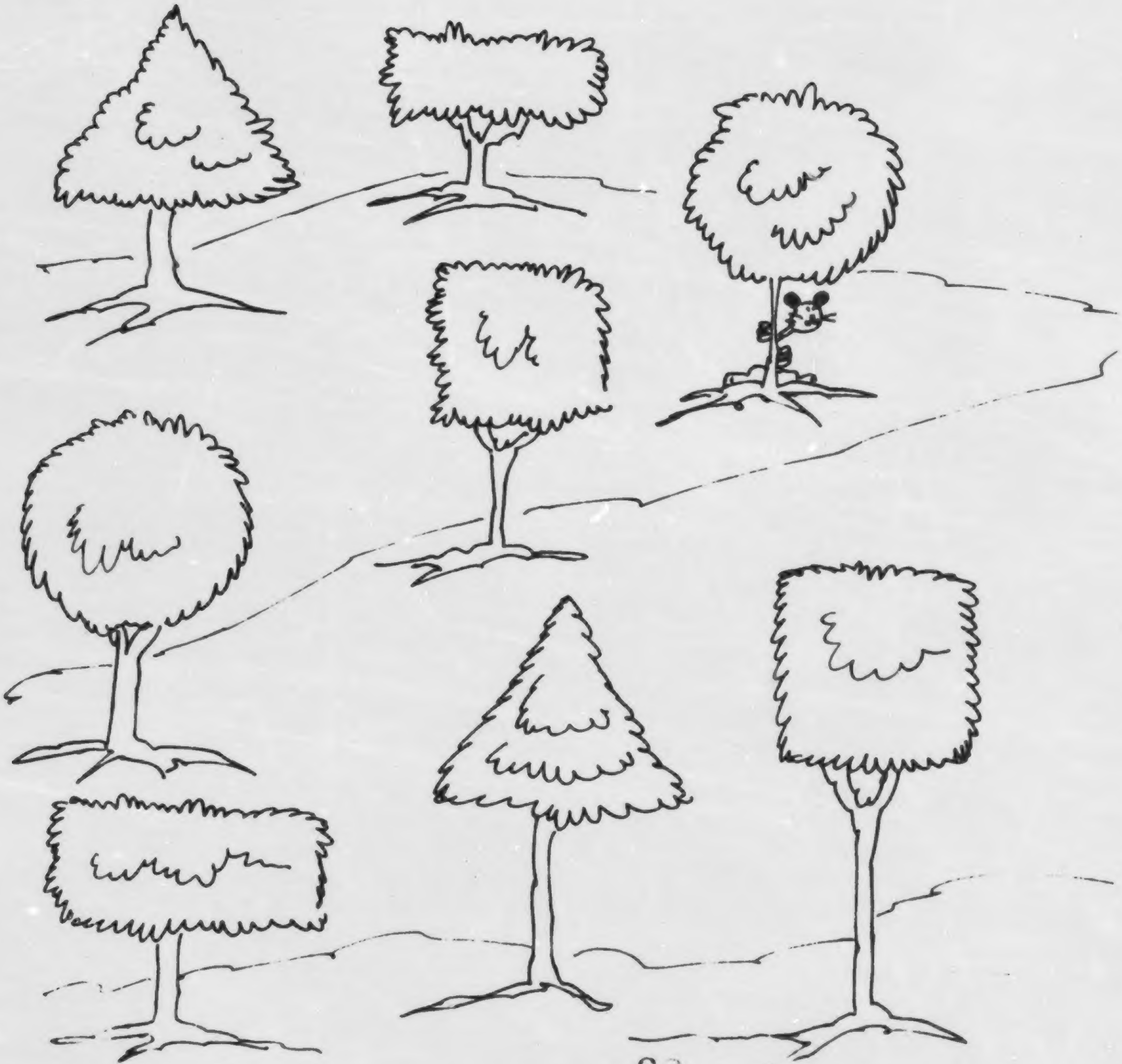
Directions:

Color the trees that look like a triangle △ green.

Color the trees that look like a circle ○ brown.

Color the trees that look like a rectangle ▭ yellow.

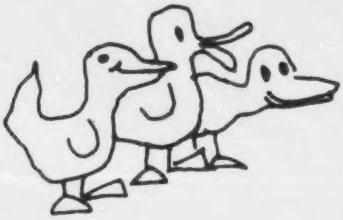
Color the trees that look like a square □ orange.



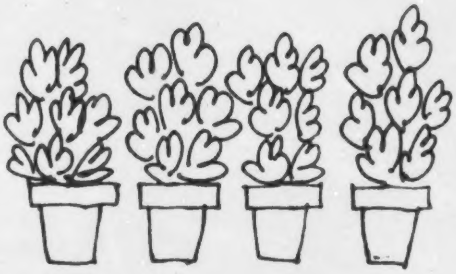
Name ______________________________

Directions:
Match the number words to the living things.

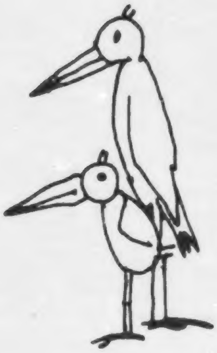
one



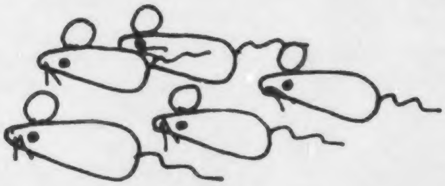
two



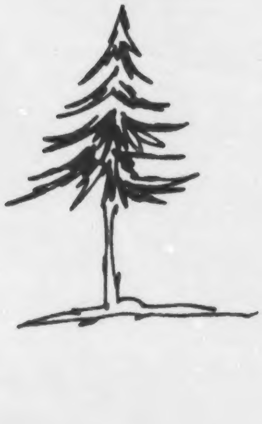
three



four



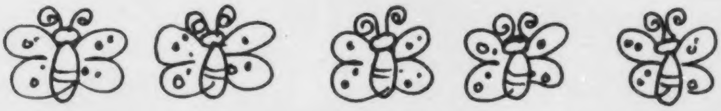
five



Name ______________________________

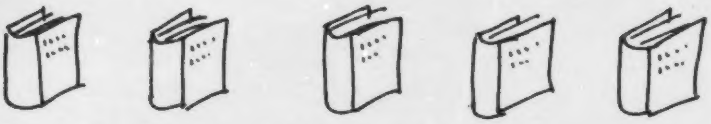
Follow the directions.

Draw a circle around the third butterfly.



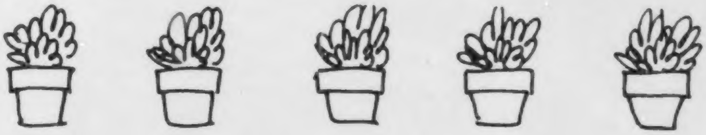
Is a butterfly a living thing? Yes No

Draw a circle around the second book.



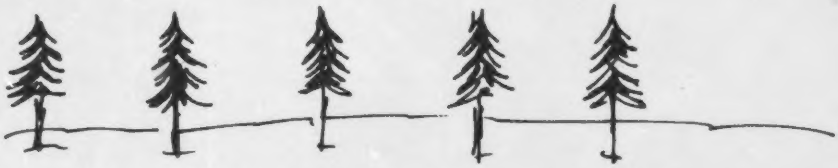
Are books living things? Yes No

Draw a circle around the fourth plant.



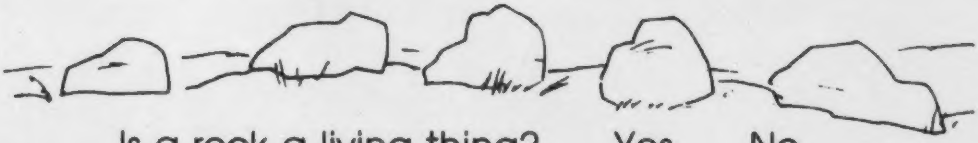
Are plants living things? Yes No

Draw a circle around the first tree.



Is a tree a living thing? Yes No

Draw a circle around the fifth rock.



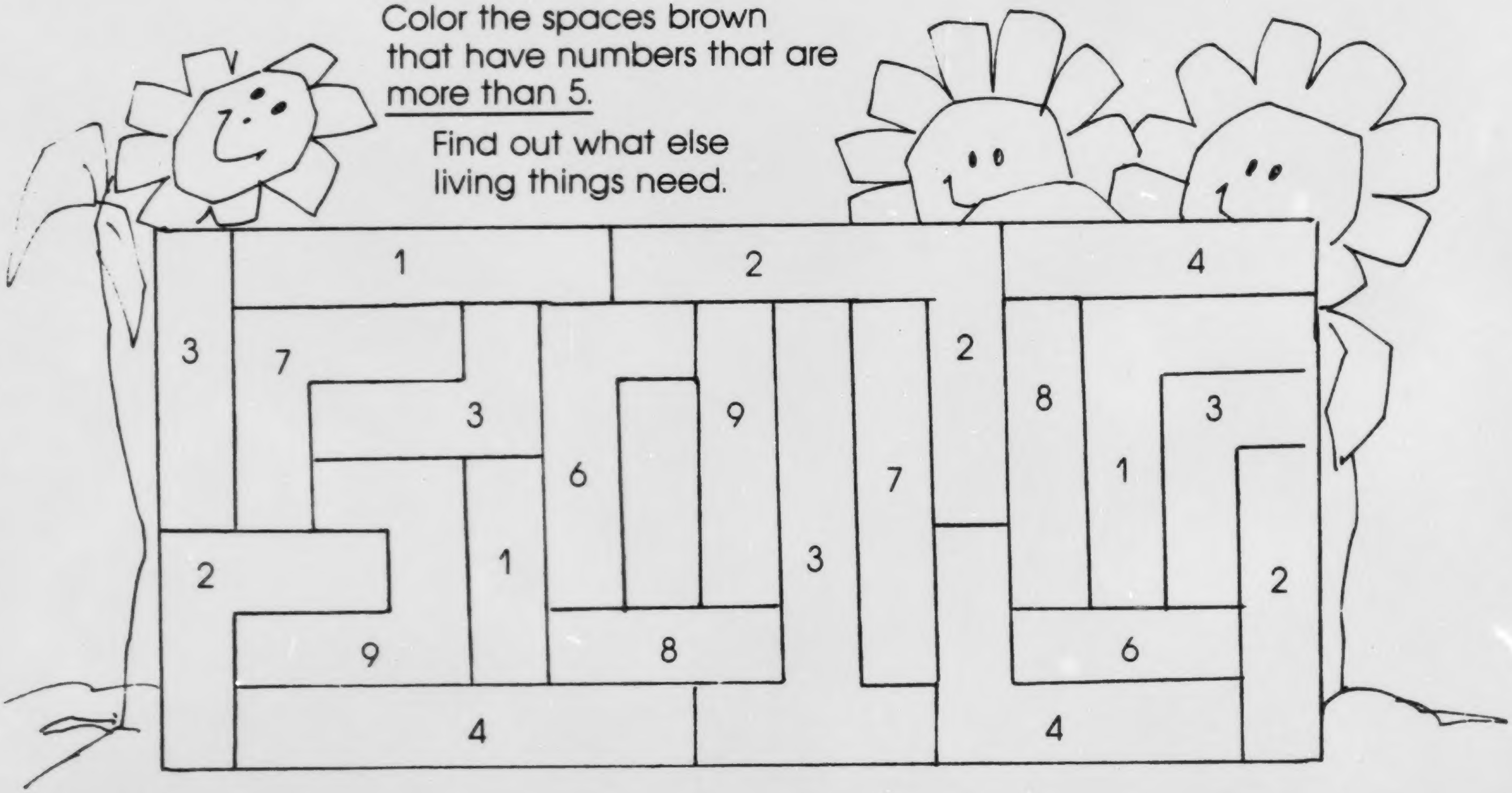
Is a rock a living thing? Yes No

Name ______________________________

All living things need air, water, and sun.
They need something else, too.

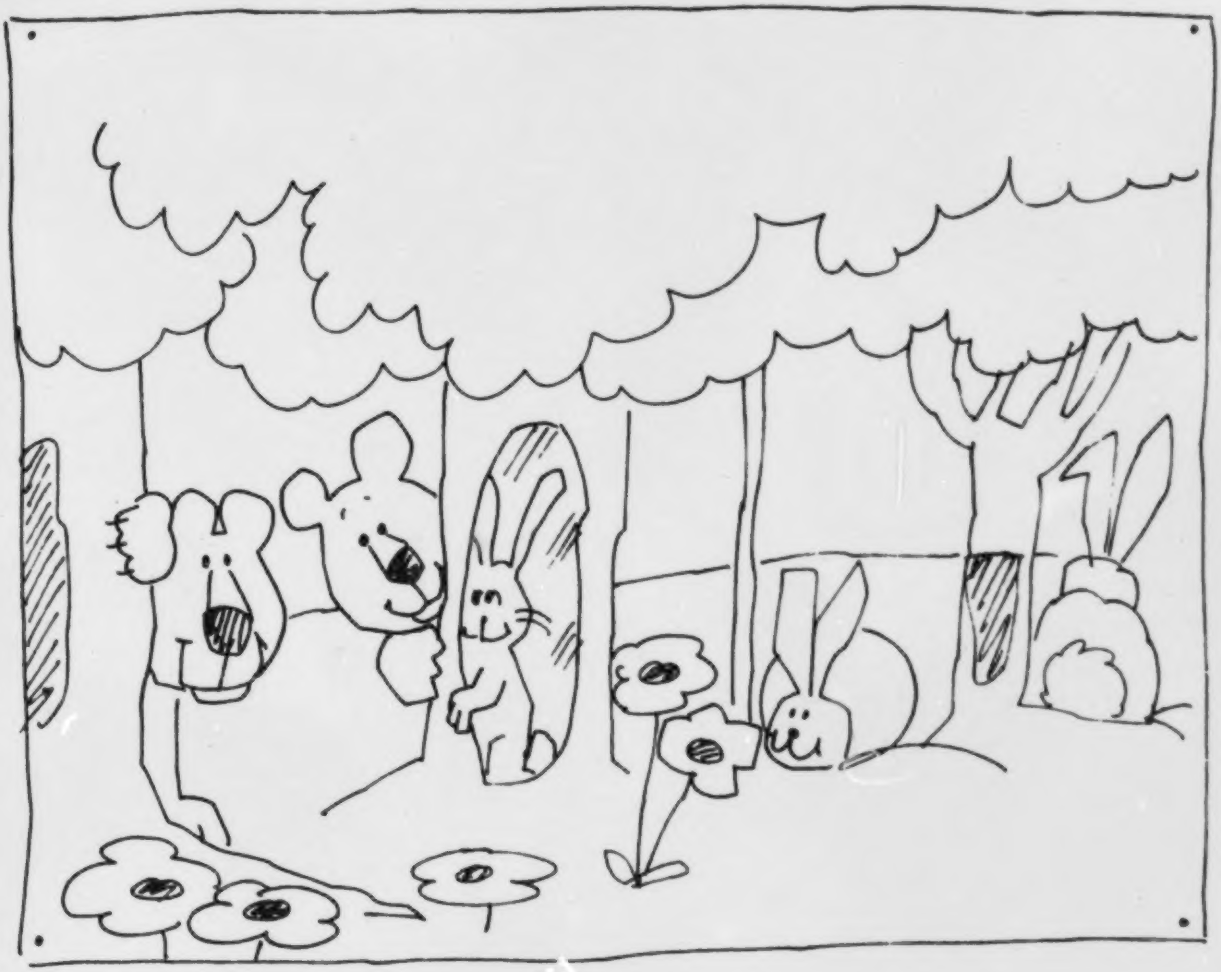
Directions:
Color the spaces brown that have numbers that are more than 5.

Find out what else living things need.


1
2
4
3
7
2
8
3
9
3
6
7
1
2
1
3
2
9
8
6
4
4

Name ____

Directions: Count. Write the numerals.



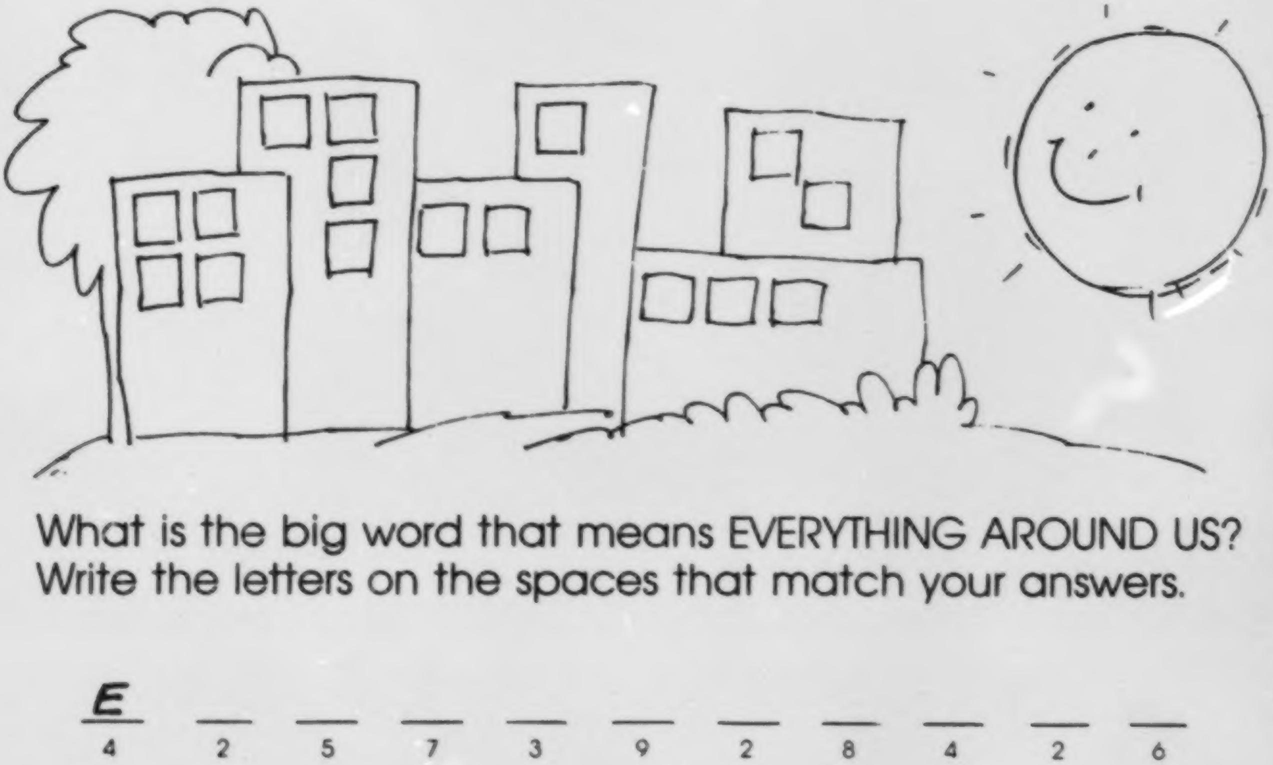
1. How many trees do you see? ________
2. How many bears can you see? ________
3. Are there more trees or more bears? ________
4. How many more? ________
5. How many rabbits can you see? ________
6. How many flowers can you see? ________
7. Are there more rabbits or more trees? ________
8. How many more? ________

67

Name

Directions:
Do the problems. Watch the signs.

9 −5 4 = E	3 +5 = M	6 −1 = V	5 +2 = I
4 +2 = T	9 −7 = N	6 +3 = O	8 −5 = R



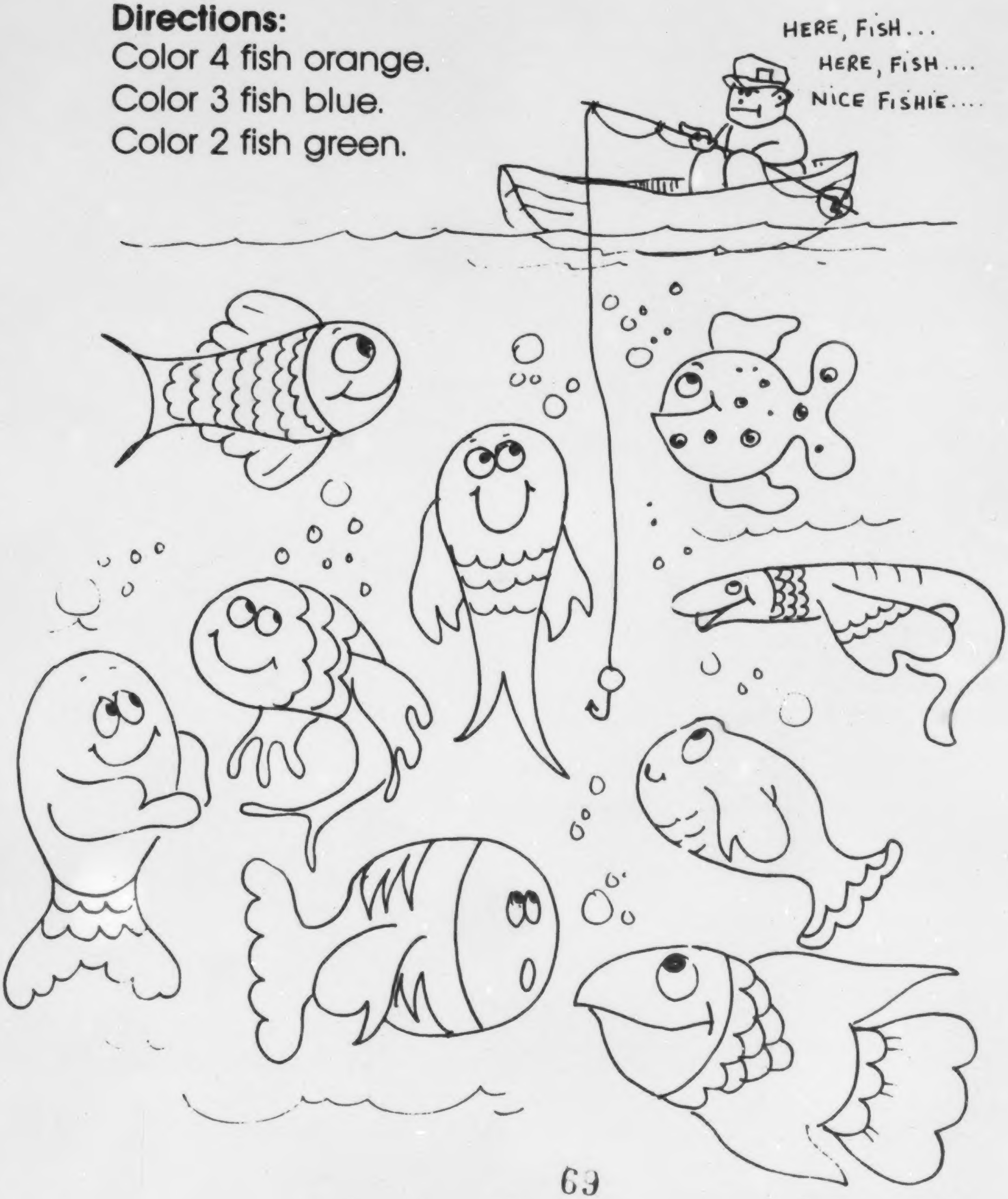
What is the big word that means EVERYTHING AROUND US?
Write the letters on the spaces that match your answers.

E										
4	2	5	7	3	9	2	8	4	2	6

Name

The environment for fish is water.

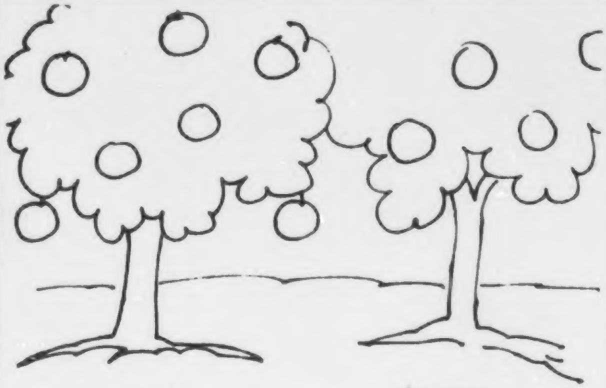
Directions:
Color 4 fish orange.
Color 3 fish blue.
Color 2 fish green.


HERE, FISH...
HERE, FISH....
NICE FISHIE....

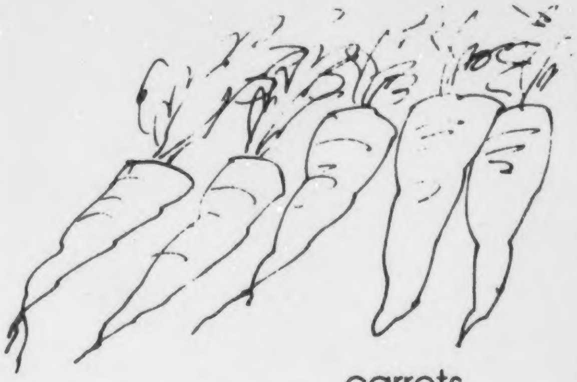
Name ____

Food comes from plants.

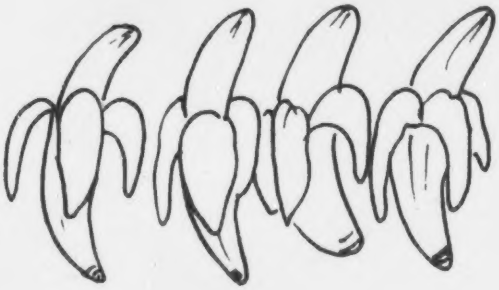
Directions:
Write the number words. one two three four five



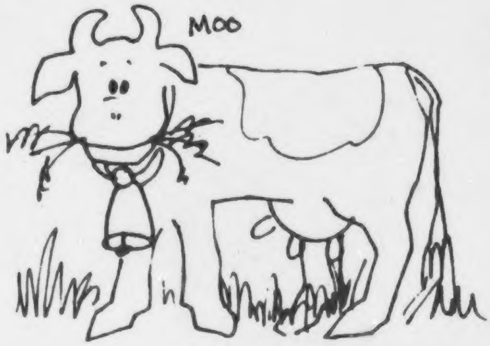
____________trees



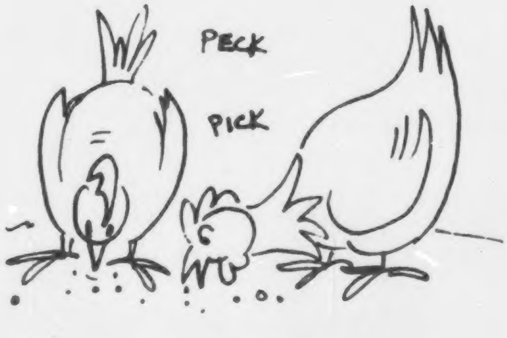
____________carrots



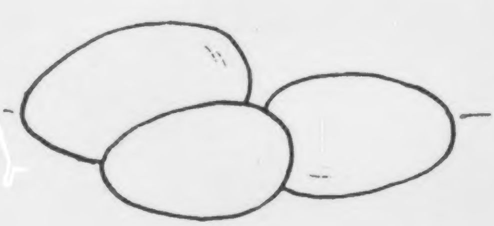
__________bananas



______________cow



__________chickens



______________eggs

Name ______________________

Chickens eat plants.
They make eggs.
Who eats the eggs?

Directions:
Write the missing number in each egg.

9 10 11 12 ___

3 4 5 6 ___

1 2 3 ___ 5

15 16 17 ___ 19

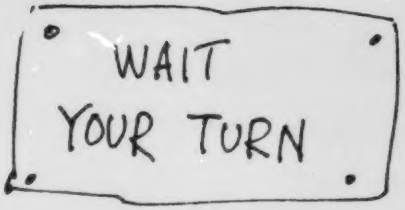
___ 6 7 8 9

6 ___ 8 9 10

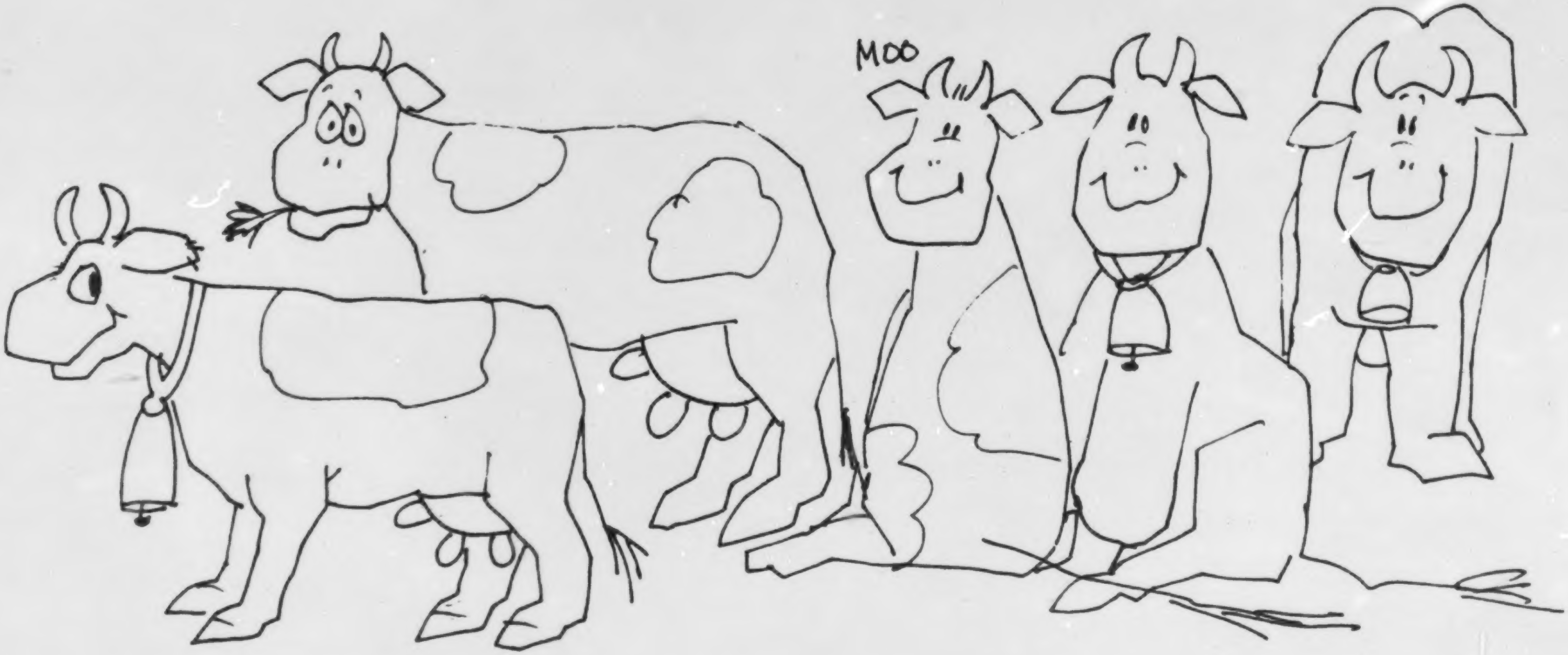
8 9 10 ___ 12

13 14 ___ 16 17

Name



Cows eat plants
They make milk. Who drinks the milk?

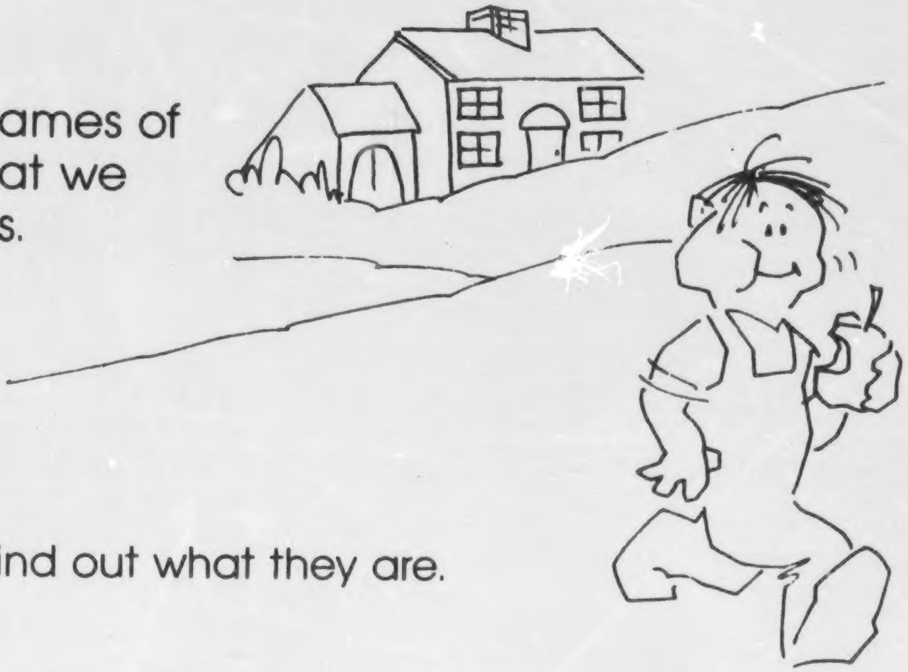


Directions:

These cows are waiting to be milked.
Color the second cow brown.
Color the fourth cow black.
Color the third cow yellow.
Color the first cow black and white.
Color the fifth cow purple.

Name ______________________________

Here are the names of three things that we get from plants.



Directions:
Do the work to find out what they are.

E 5 −4	C 7 −5	H 3 +4	S 8 −3	D 6 +4
F 3 +1	C 9 −6	L 5 +4	T 7 −1	U 5 +3

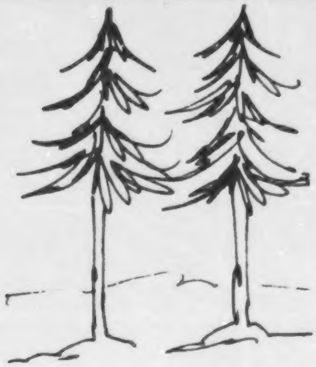
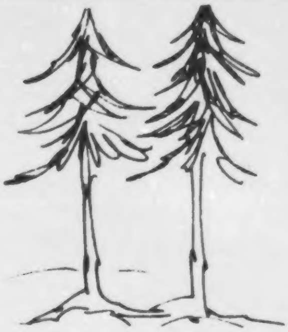
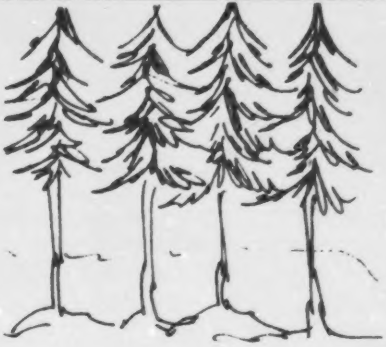
__ __ __ __ , __ __ __ __ __ __ __ ,
4 2 2 10   3 9 2 6 7 1 5

and __ __ __ __ __ __ .
7 2 8 5 1 5

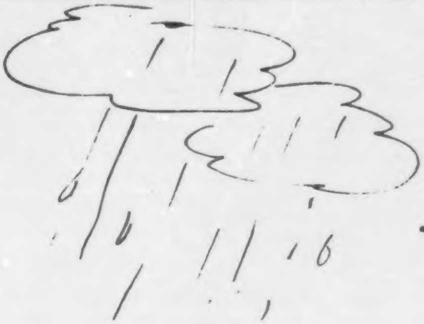
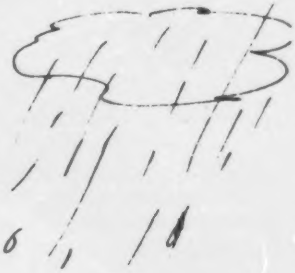
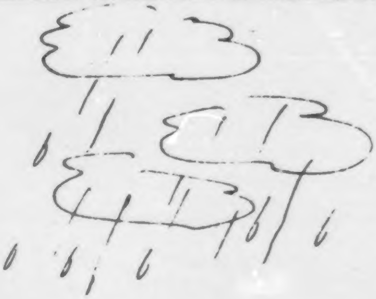
Name ____________________

These things can clean the air.

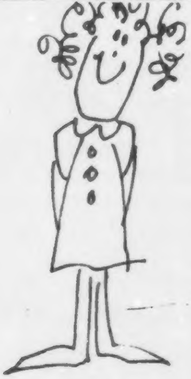
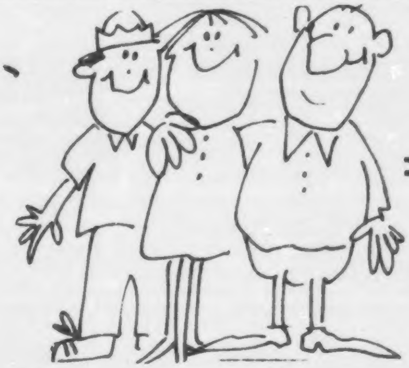
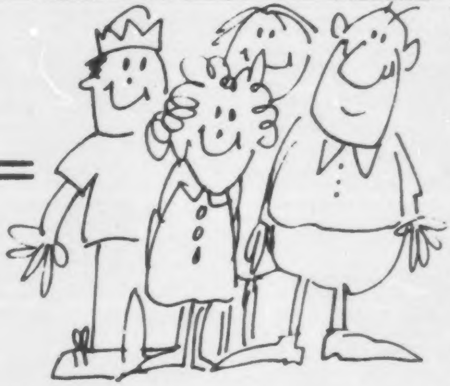
Directions:
Write the numbers. Add.


+

=


____ + ____ = ____


+

=


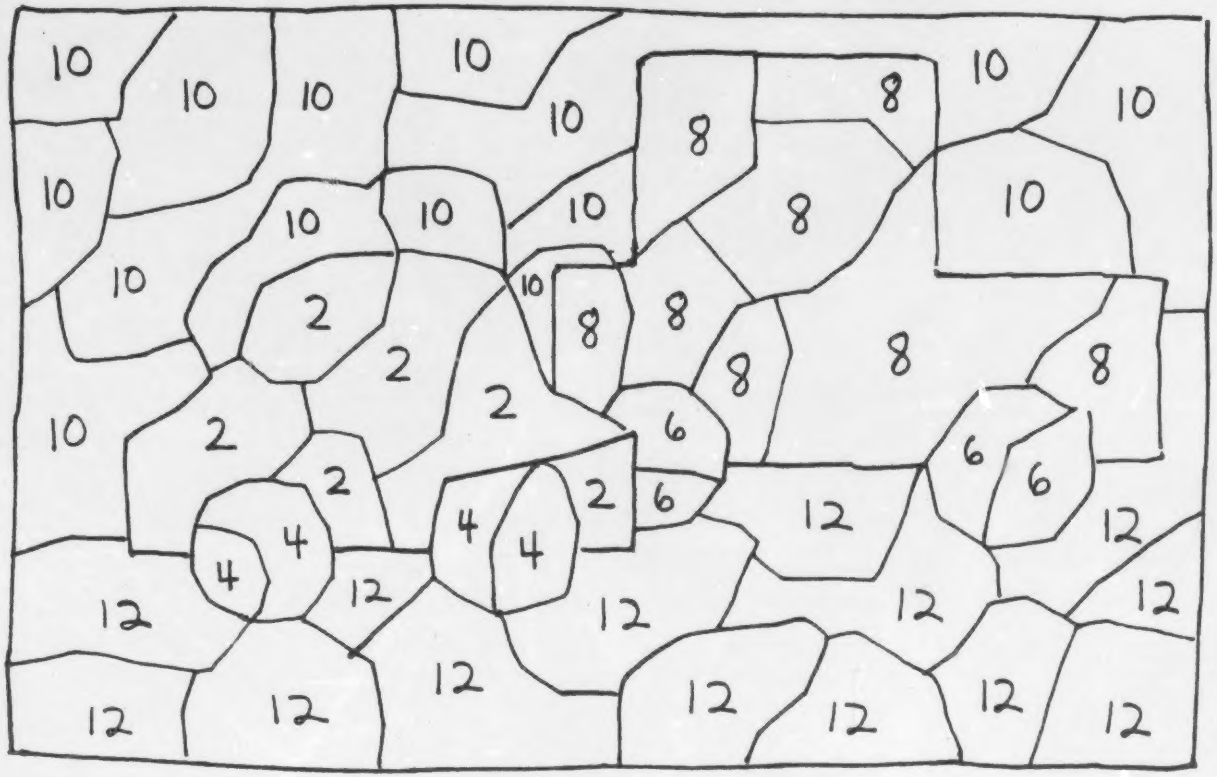
____ + ____ = ____


+

=


____ + ____ = ____

Name ________________________________

These can make the air dirty.

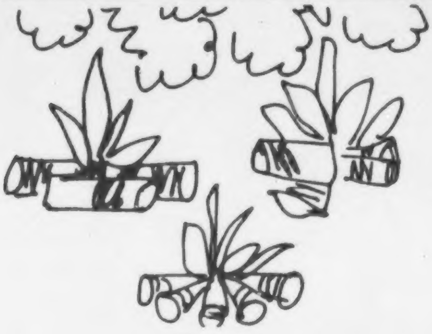
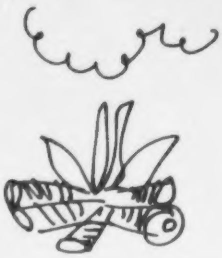
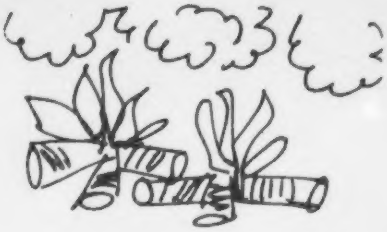

10
10
10
10
10
8
8
10
10
10
8
10
10
10
10
10
8
10
2
8
8
8
8
2
10
2
6
2
6
6
2
4
2
6
12
12
4
4
4
12
12
12
12
12
12
12
12
12
12
12
12

Directions: Color the 2's yellow.
Color the 4's brown.
Color the 6's black.
Color the 8's red.
Color the 10's blue.
Color the 12's green.

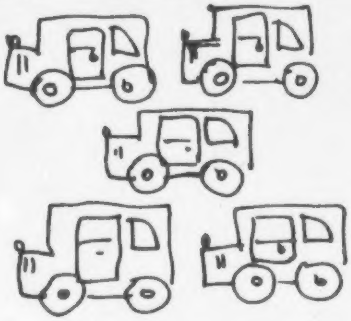
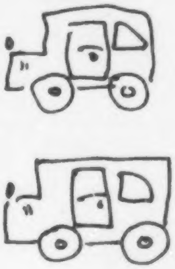
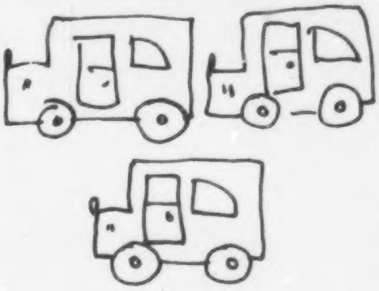
Name ________________________________

These things can cause air pollution.

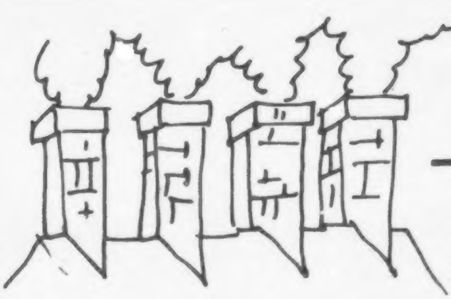
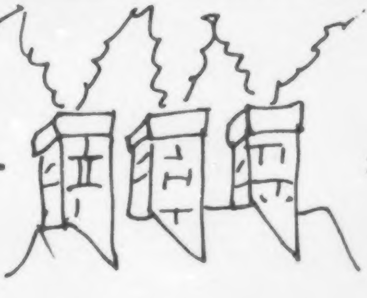
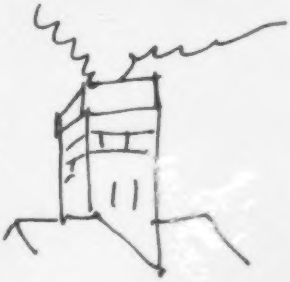
Directions: Write the numbers. Subtract.


–

=


_______ – _______ = _______

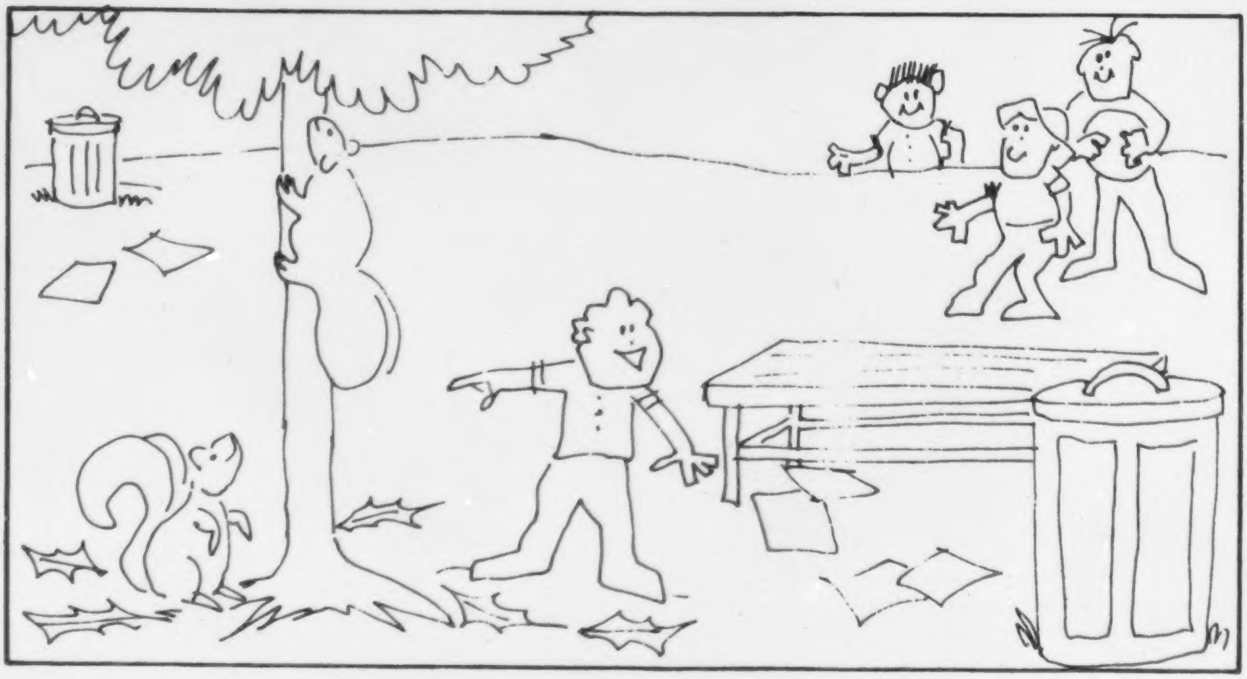

–

=


_______ – _______ = _______


–

=


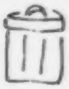
_______ – _______ = _______

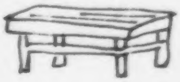
Name ______________________________

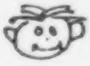


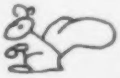
There is lots of litter in the park. Use the picture to answer the questions.

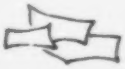
Directions: Circle the right answer.

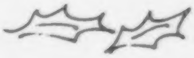
How many  do you see? 3 2 5

How many  do you see? 1 4 2

How many  do you see? 7 4 5

How many  do you see? 3 2 1

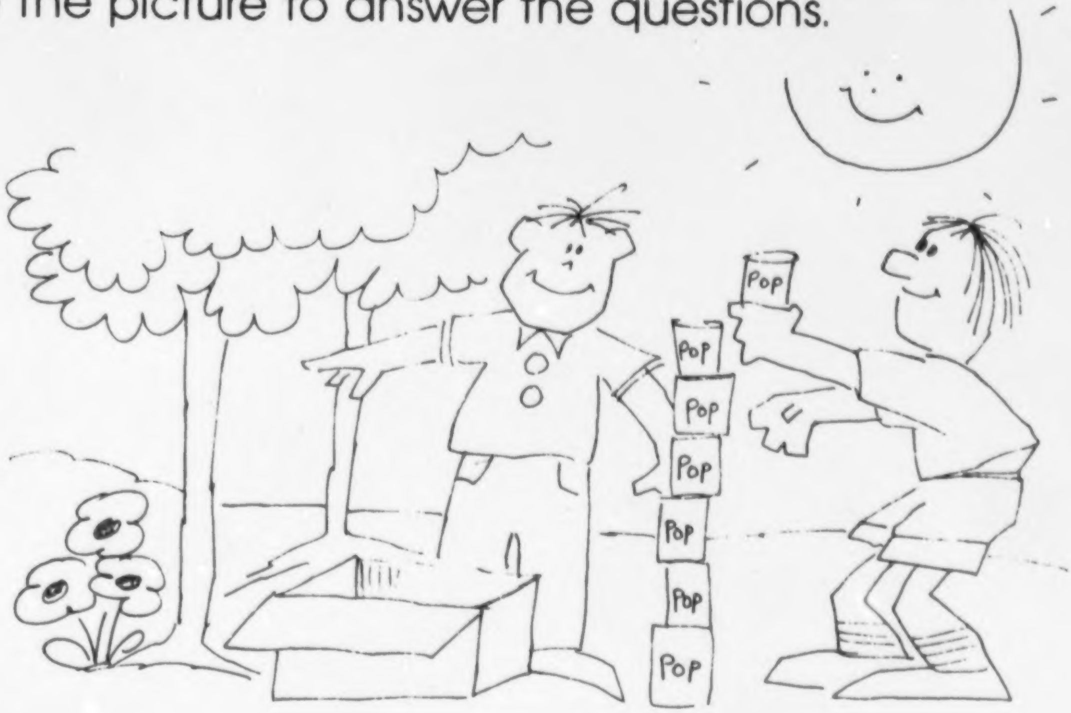
How many  are on the ground? 4 6 2

How many  are on the ground? 5 1 3

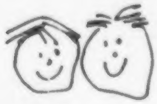
Where is a good place to put the litter?
Color them red.

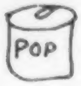
Name

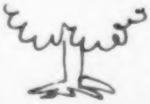
Jennifer and Mark are saving cans for recycling. Use the picture to answer the questions.

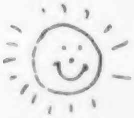


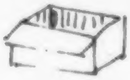
Directions: Circle the correct numeral:

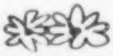
How many  do you see? 2 3 5

How many  do you see? 4 6 7

How many  do you see? 3 2 1

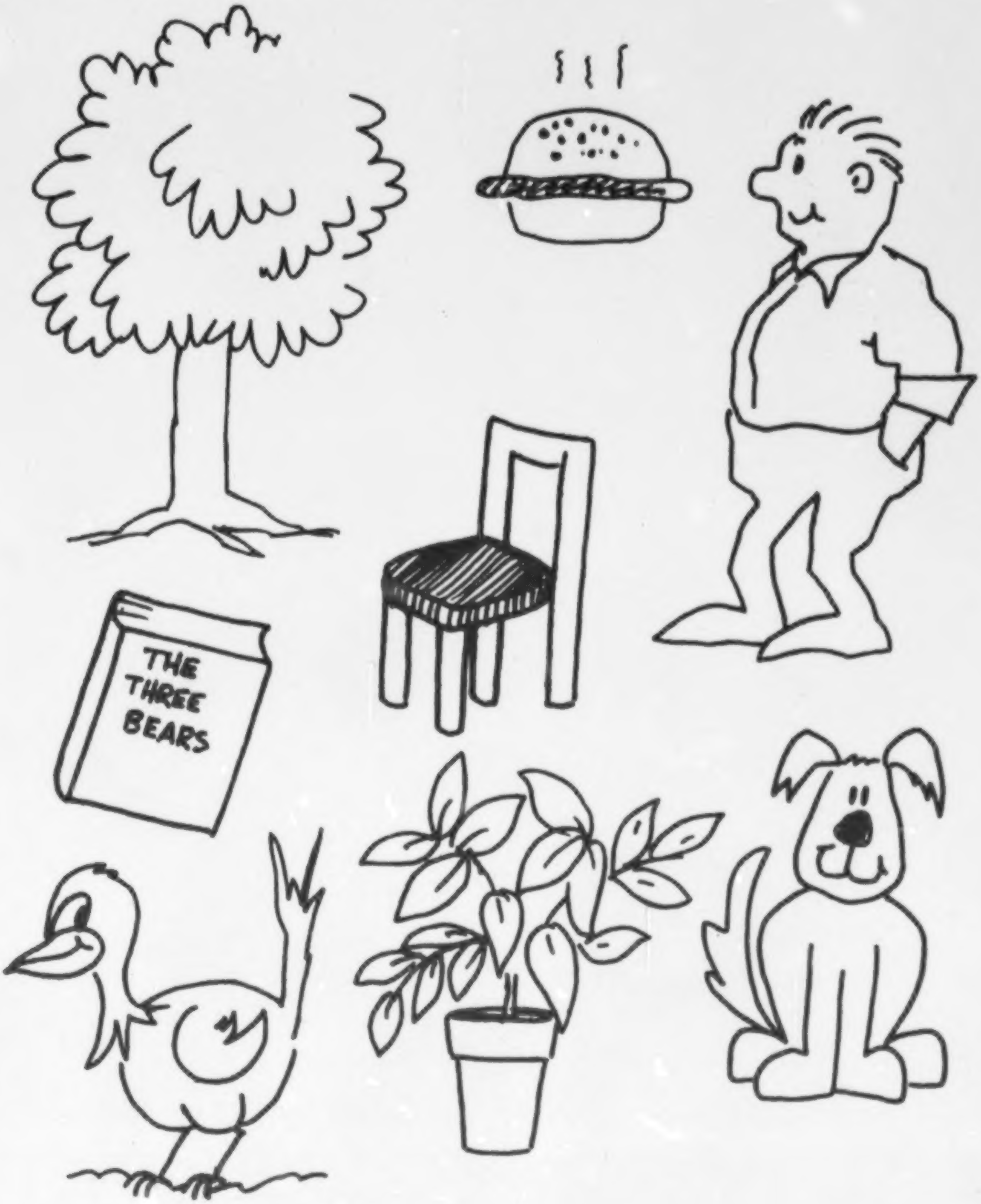
How many  do you see? 5 1 2

How many  do you see? 1 3 7

How many  do you see? 5 6 3

Name ______________________________

Directions:
Color the things that are living.

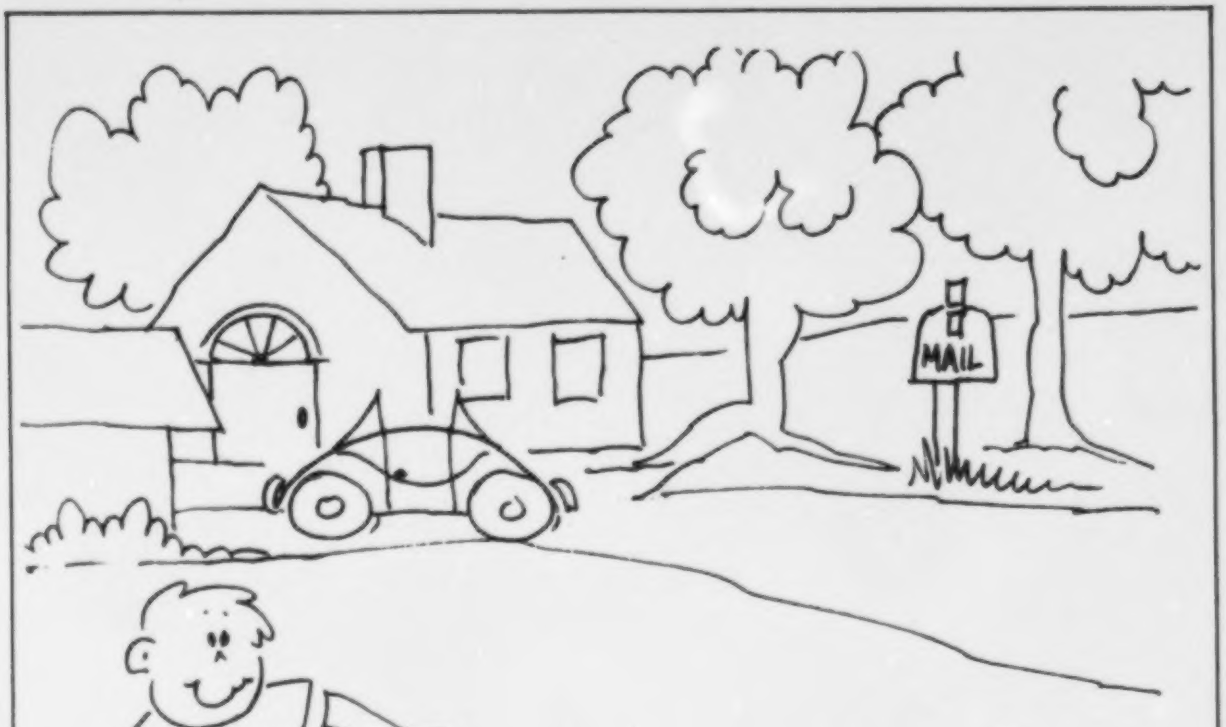

THE THREE BEARS

How many do you see? ______________________________

Name

Animals and plants are living things.

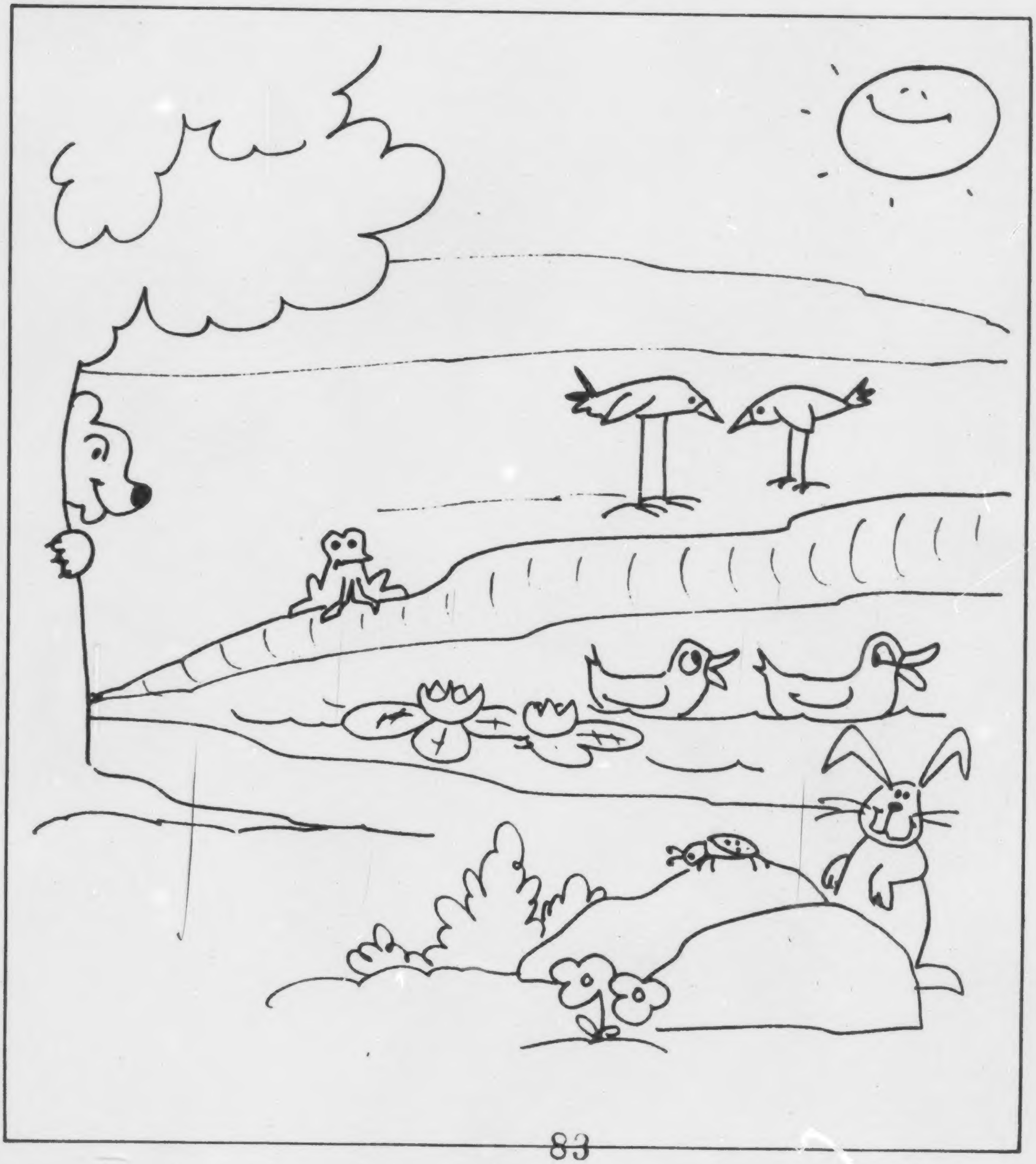
Directions:
Color all the things that are alive. Put an X on the things that are not alive.



Name

Animals can move around. Plants can not.
Some animals can run and jump.
Some can swim or fly.

Directions: Color the animals.

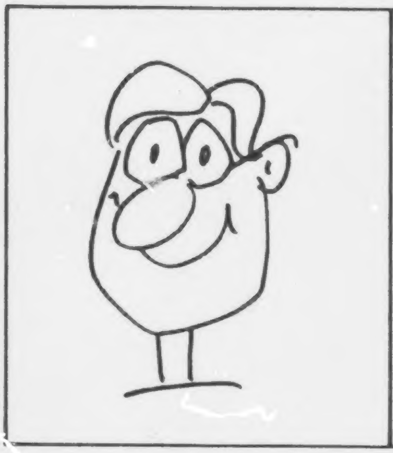


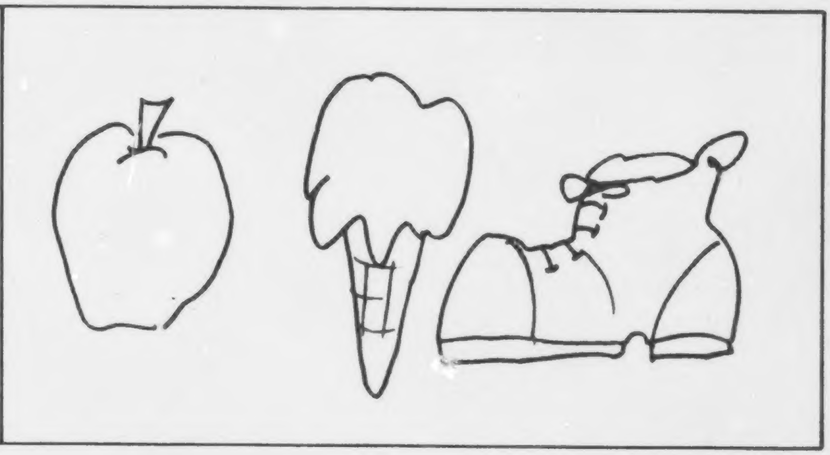
83

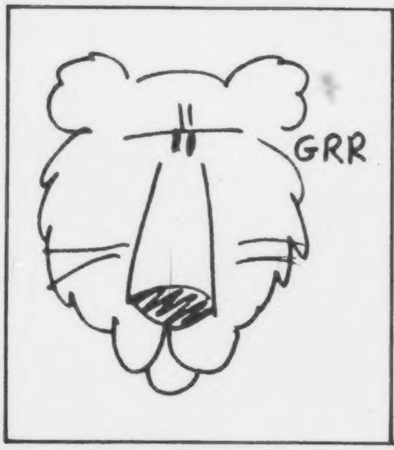
Name

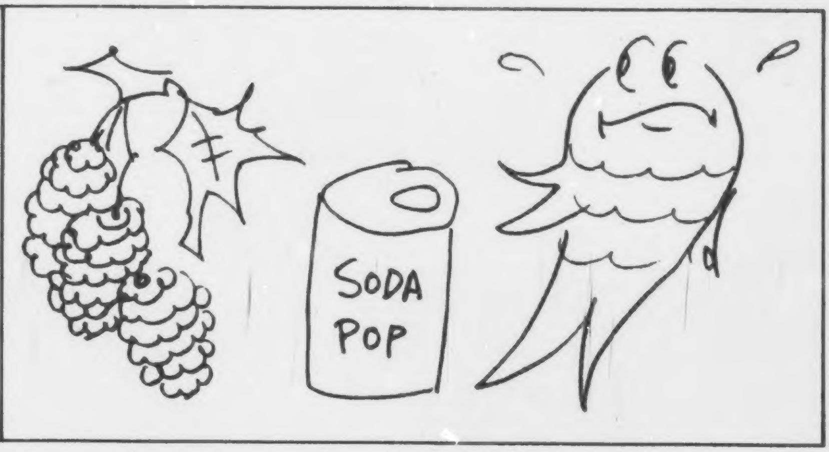
Animals need food to grow.

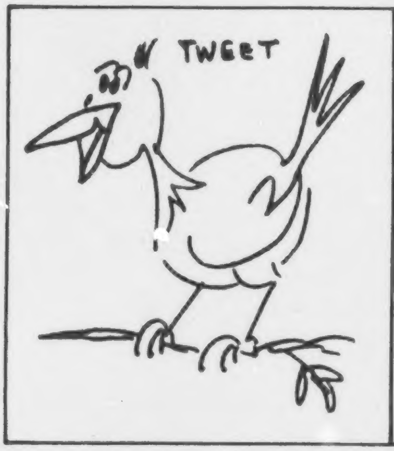
Directions:
Draw a circle around the things each animal can eat.

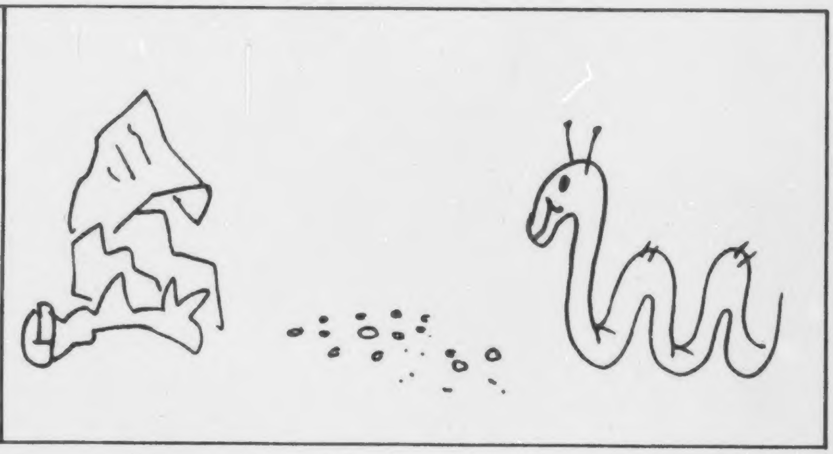












Name ______________________

All animals need plants to live. Plants give us air to breathe. They give us many other things, too.

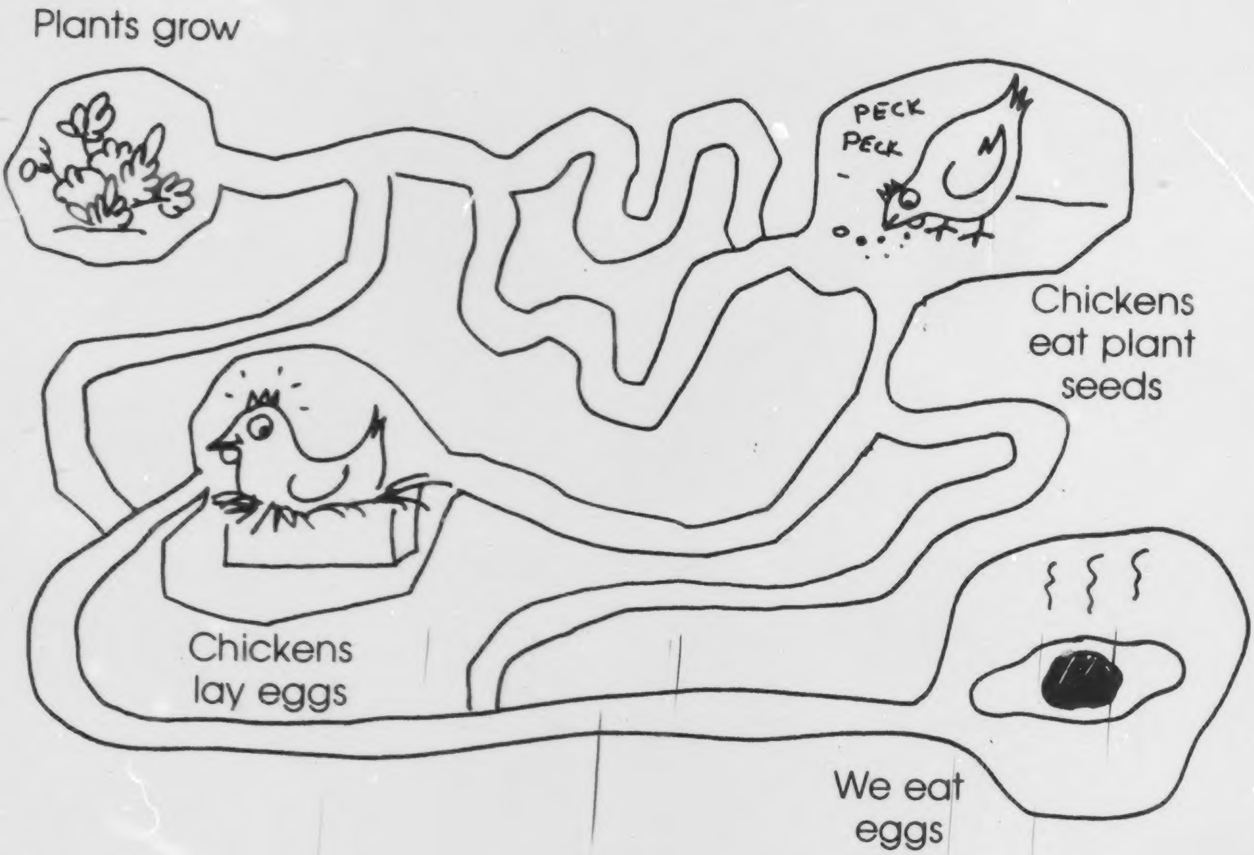
Directions:
Draw a picture in each box to show other things we get from plants.

We get food from plants.	Plants give us houses to live in.
Plants make our land pretty.	We get clothes from plants.

Name ______________________

All our food comes from plants. Even the eggs, milk, and meat we eat starts first with plants.

Directions:
Follow the right path to see how plants turn into eggs.


Plants grow
PECK
PECK
Chickens eat plant seeds
Chickens lay eggs
We eat eggs

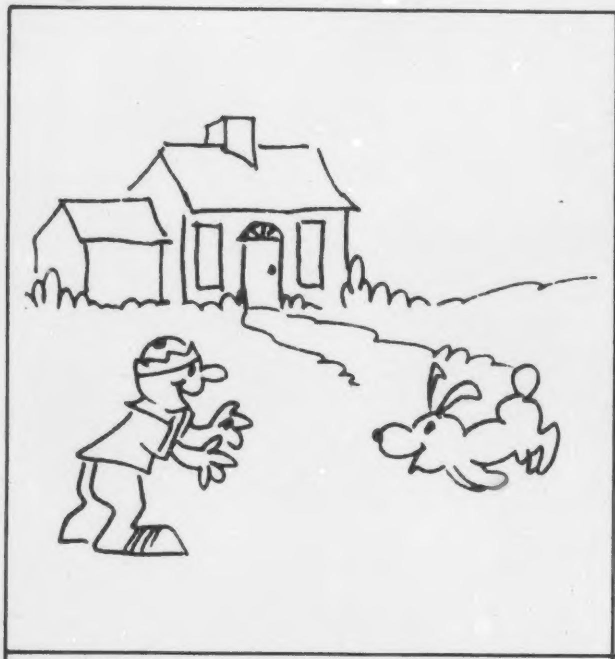
Write what happens:
1. Plants grow
2. ______________________
3. ______________________
4. ______________________

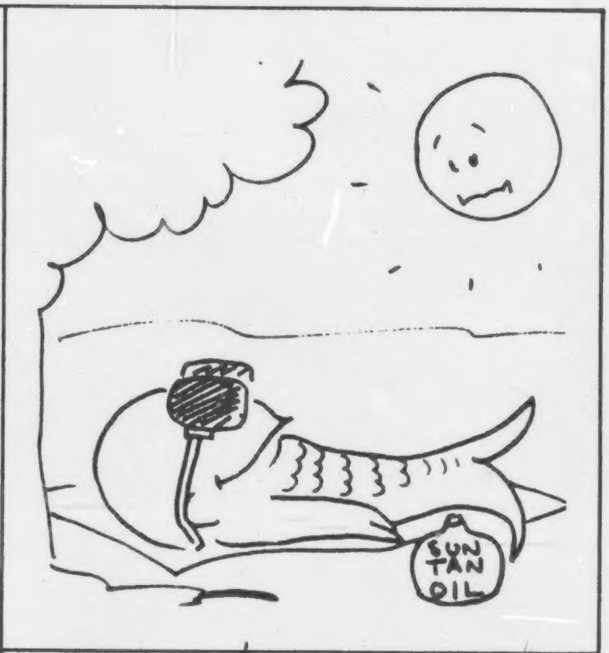
Name ______________________________

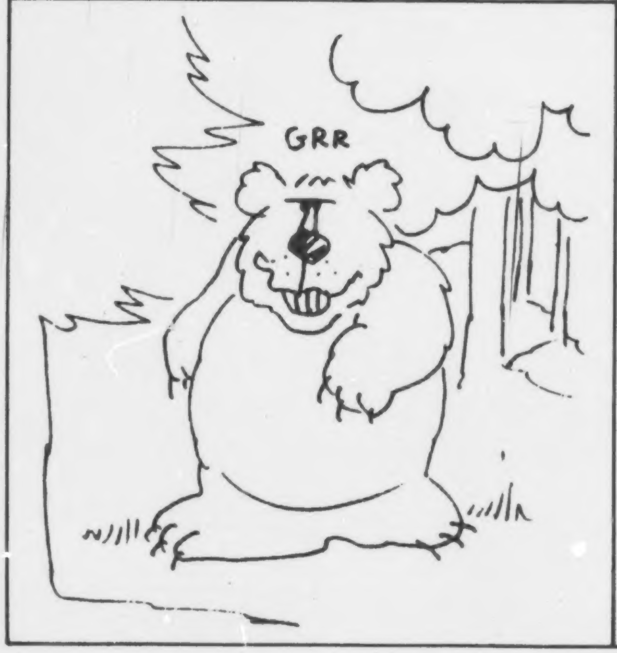
The environment is everything around us. It is all the things we need to live.

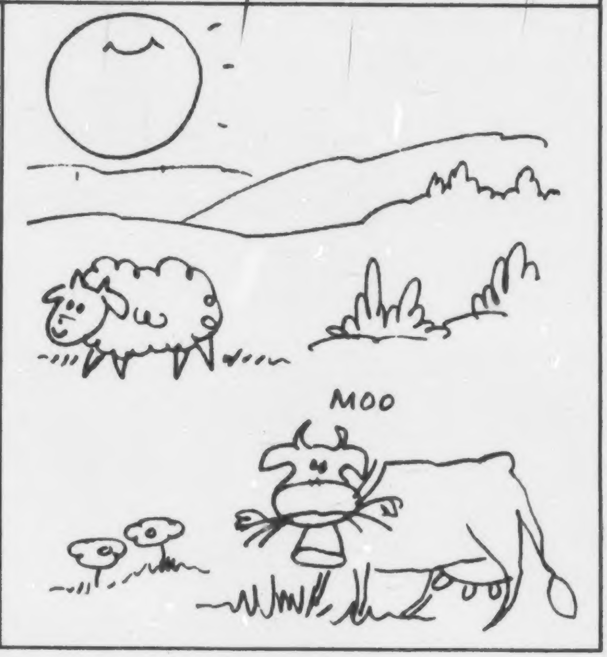
Directions:

Color the pictures that show animals in the right environment. Put an X on the picture that is wrong.







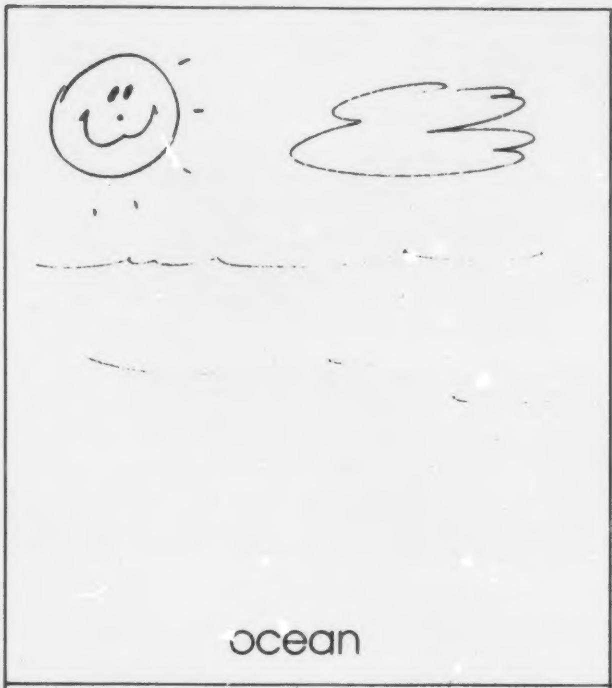


Name ______________________________

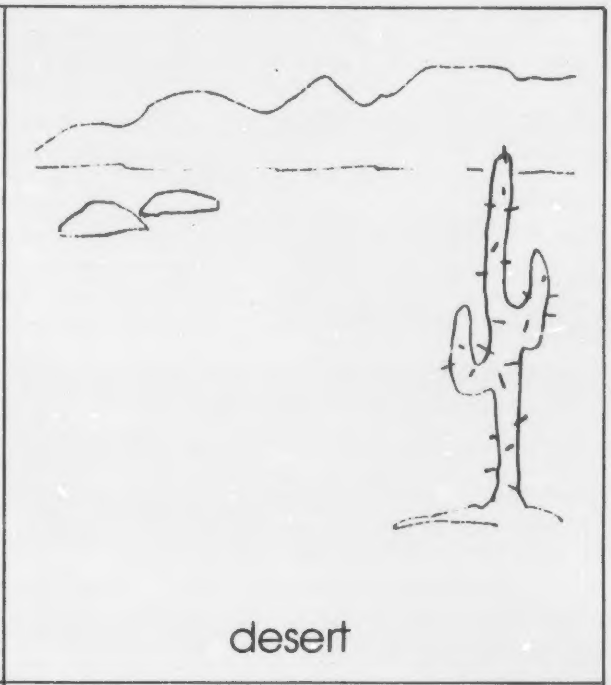
____

Every animal has a special place in its environment where it lives best. This is its habitat.

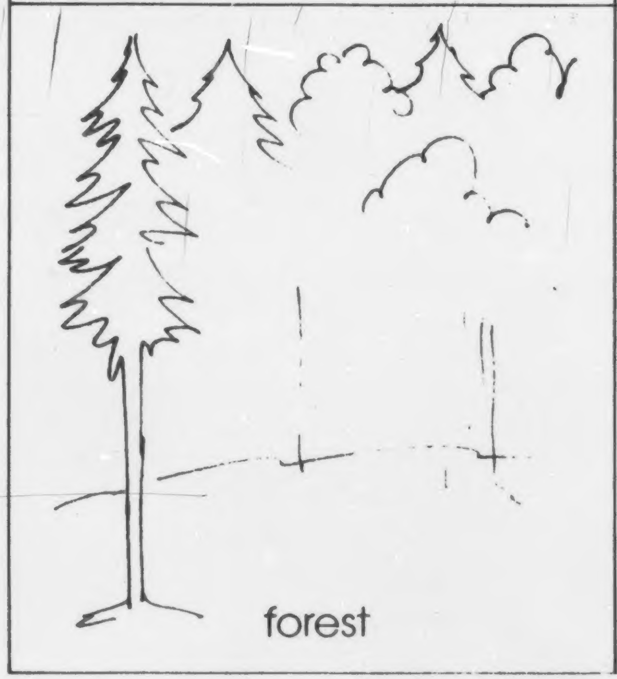
Directions:
Draw an animal that lives in each of the habitats below.



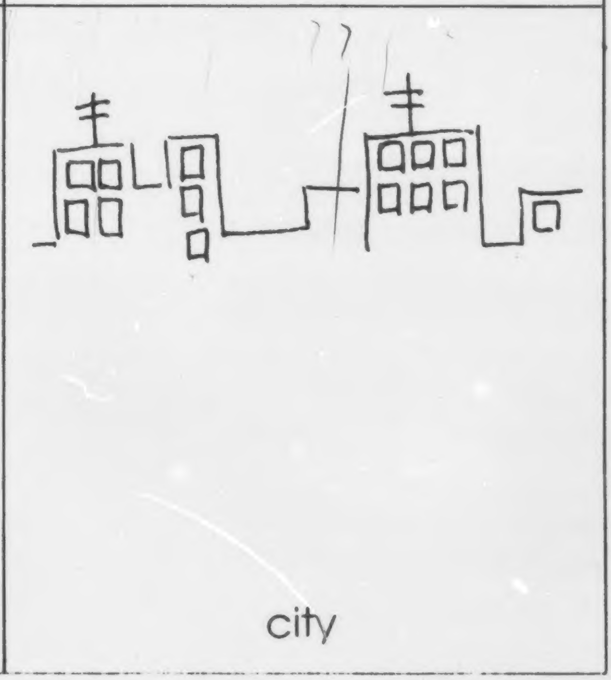
ocean



desert



forest

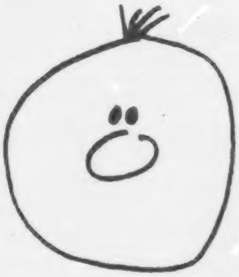


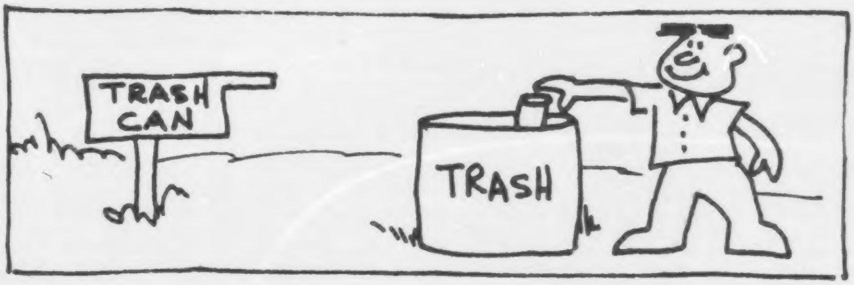
city

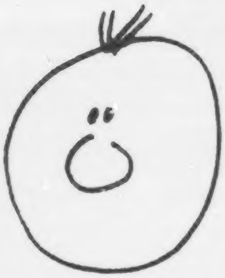
Name

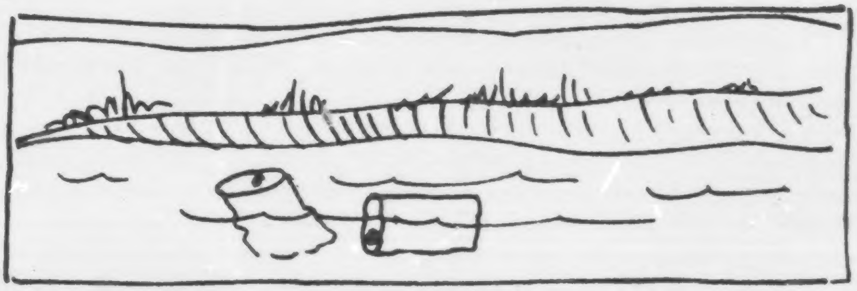
Here are some things we can do for our environment.

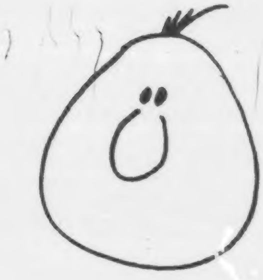
Directions:
Draw a smile if this picture will help. Draw a frown if this picture is bad for our environment.

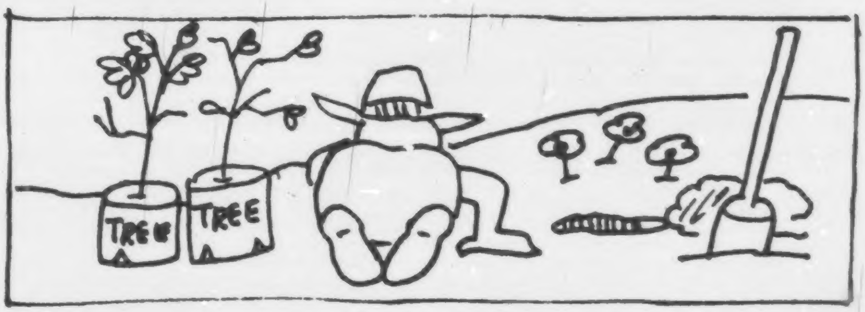


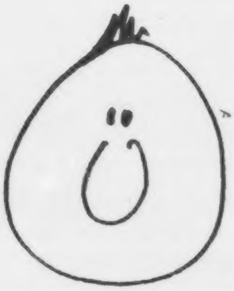

TRASH CAN
TRASH

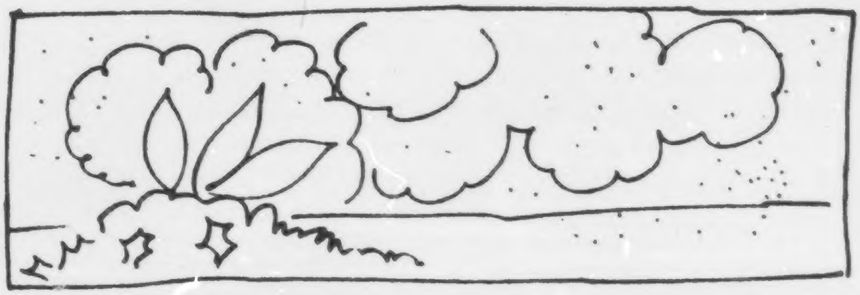






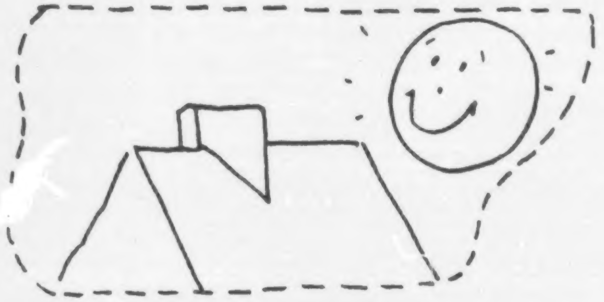


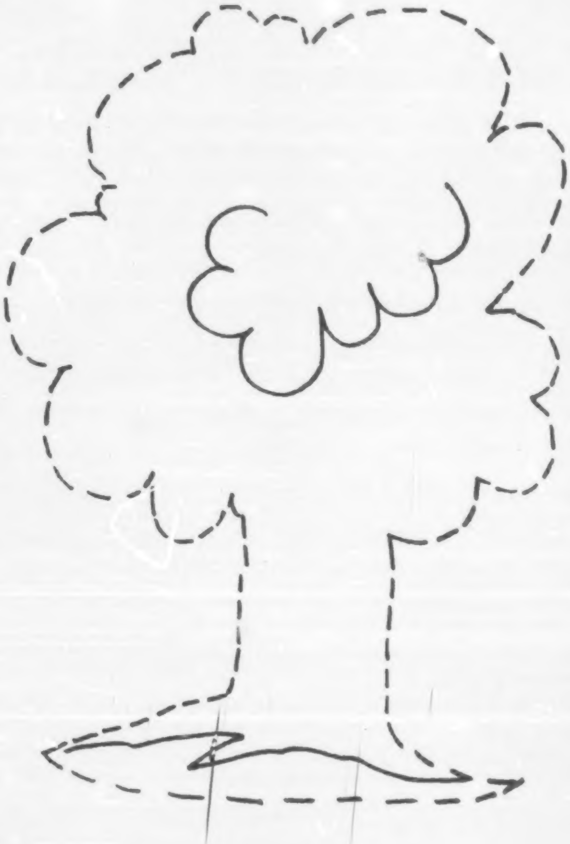


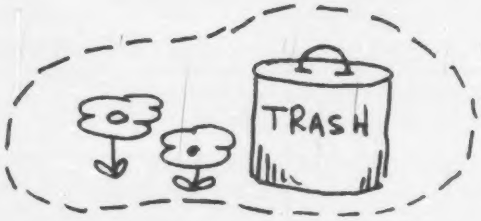


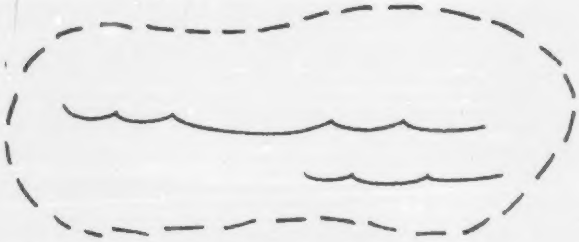
We need clean air to breathe.
We need clean water to drink.
We need to keep our land clean, too.

Directions:
Cut out these shapes on the dotted lines. Paste them on the picture to clean up the environment.

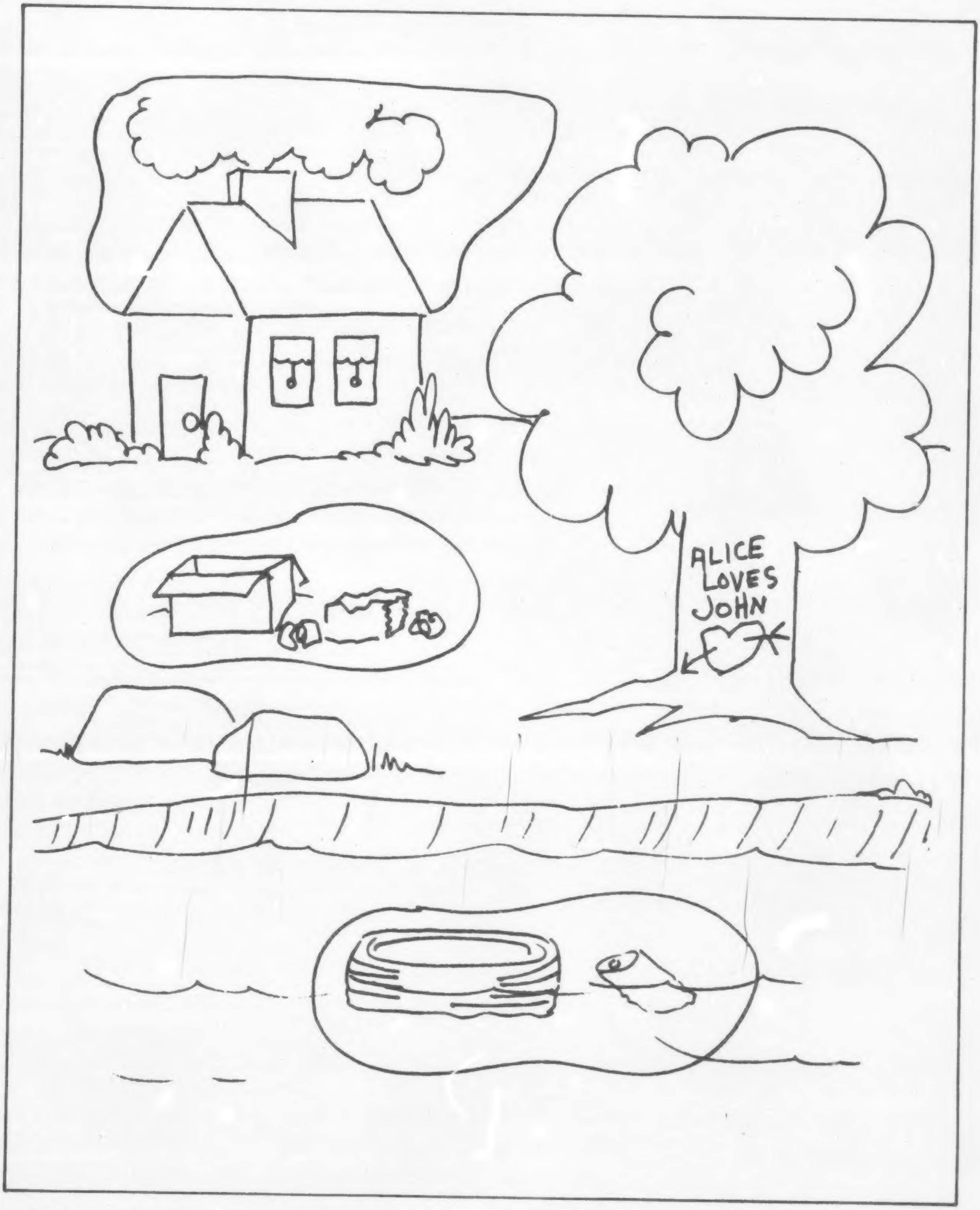








Name

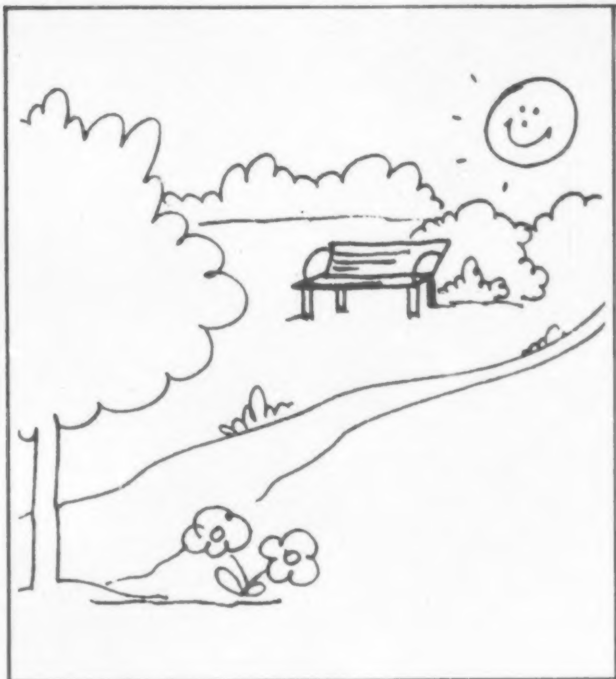

ALICE
LOVES
JOHN

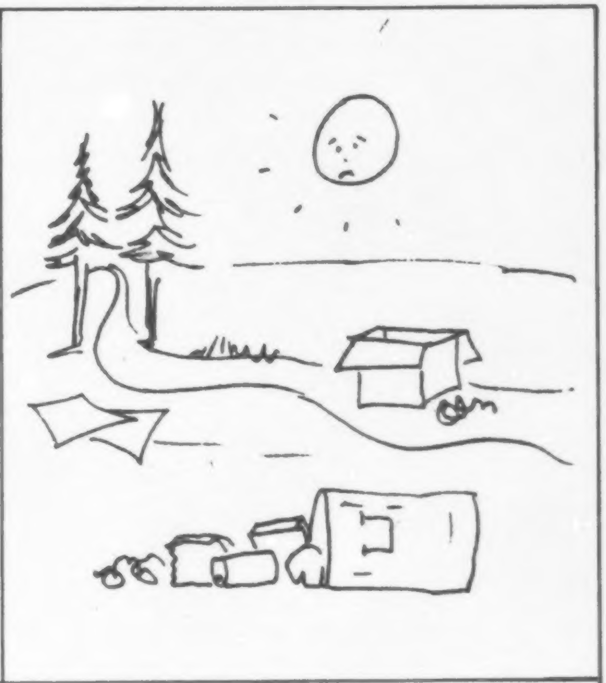
We all need help to keep our environment clean.

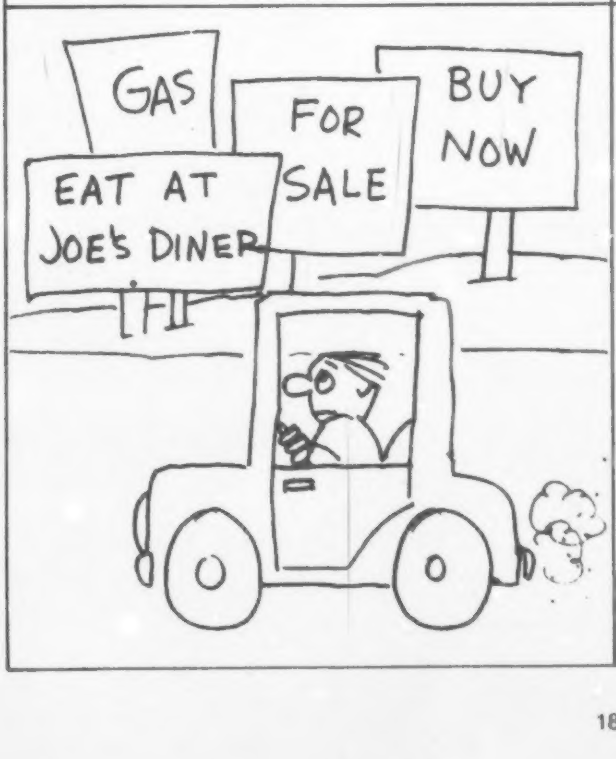
Name

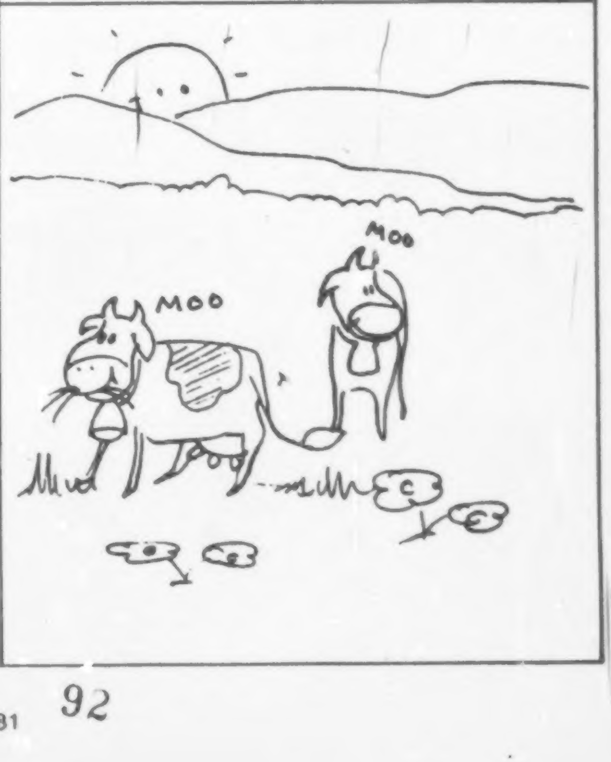
Sometimes people pollute the land. Polluted land does not look very nice.

Directions:
Color the pictures that show land that is not polluted.





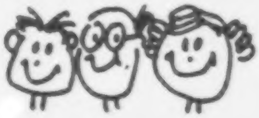
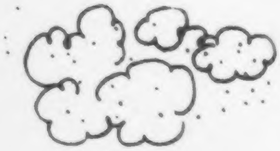
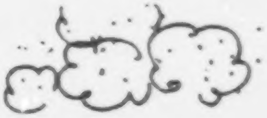
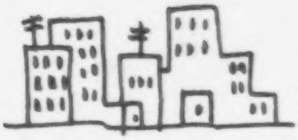
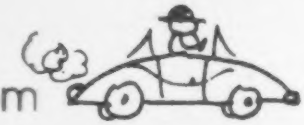
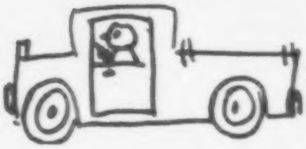
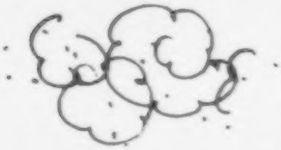
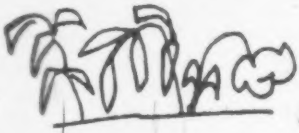
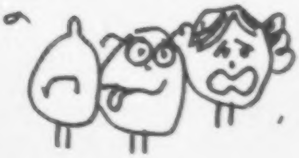
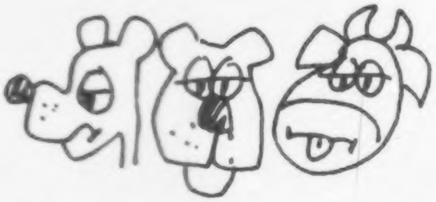

GAS
FOR SALE
BUY NOW
EAT AT JOE'S DINER



Name

How does air get polluted?

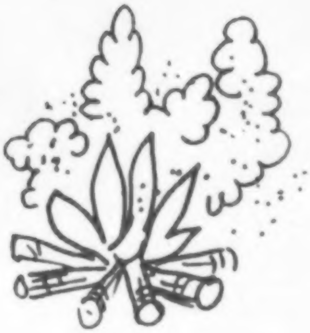
Directions:
Use the pictures to read the story.

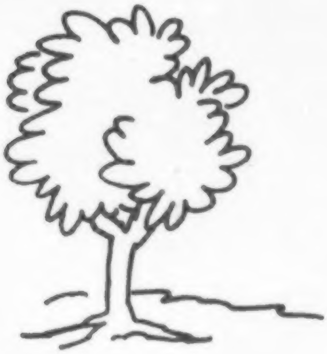
When  burn things,  gets in the air.  comes from many of our s. Smoke comes from s and s also.  makes the air dirty or polluted. Dirty air is bad for , , and other s.

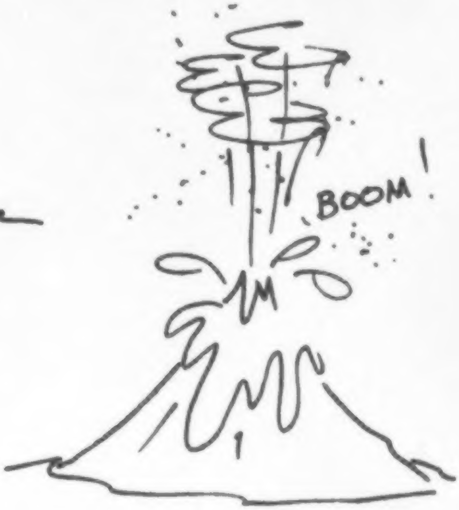
Circle the right answers.

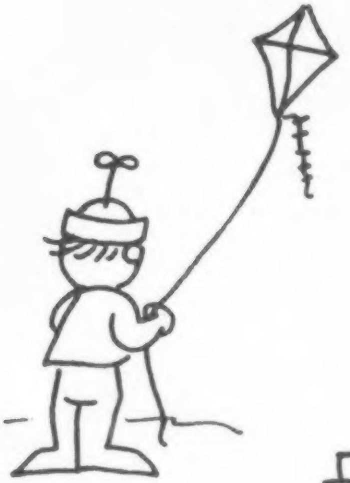
Is polluted air dirty?	Yes	No
Does smoke make the air polluted?	Yes	No
Is polluted air good for plants?	Yes	No
Is polluted air good for animals?	Yes	No

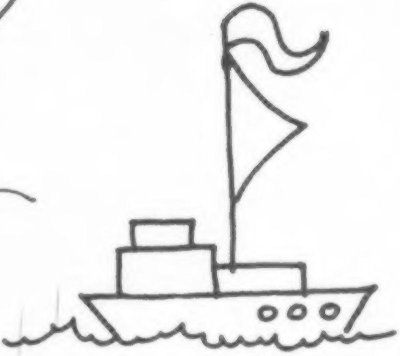
Name

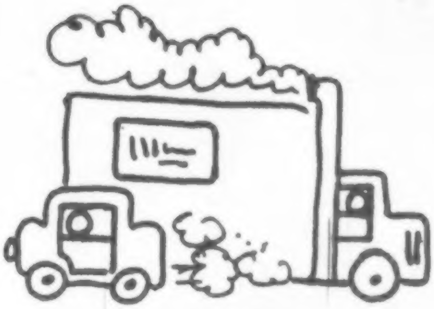


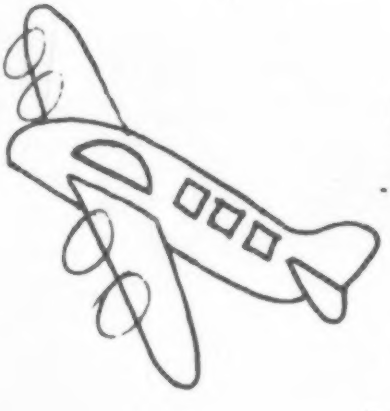


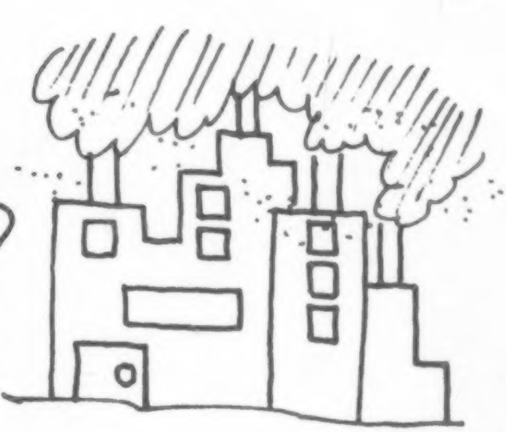


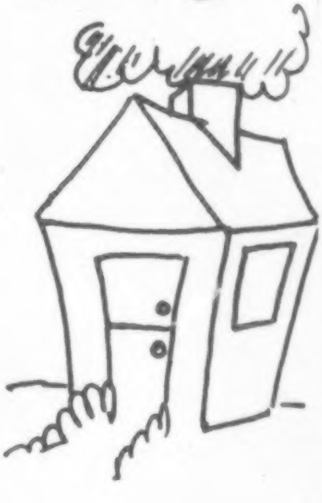












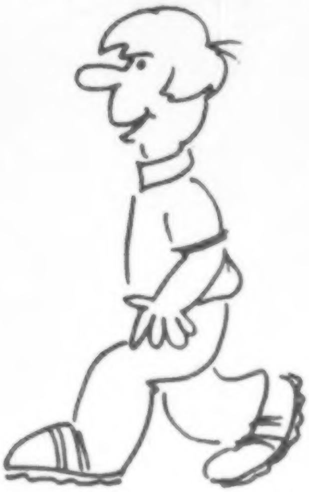
Put an X on the things that cause air pollution.

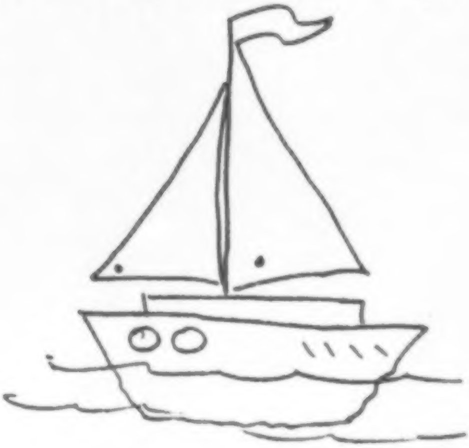
Name

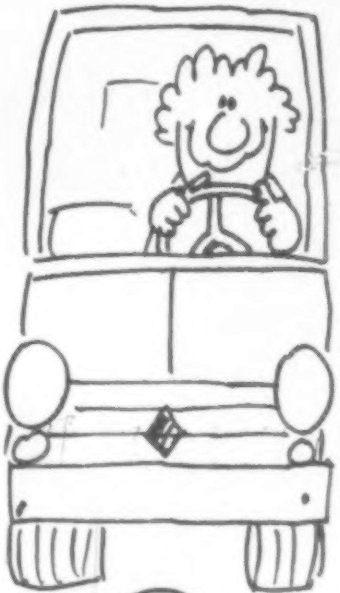
The way we get to places can help or hurt our environment.

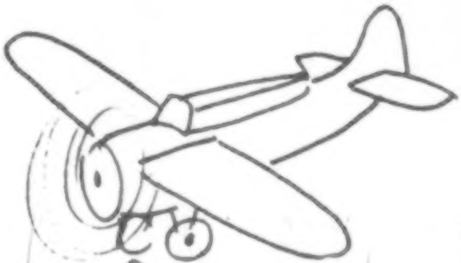
Directions:

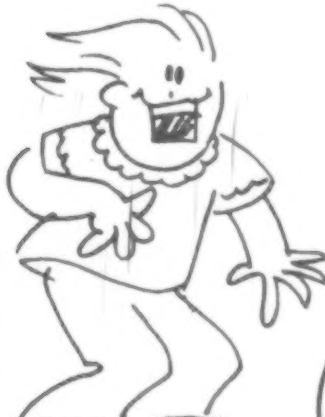
Circle the ways of moving that do not pollute our environment.

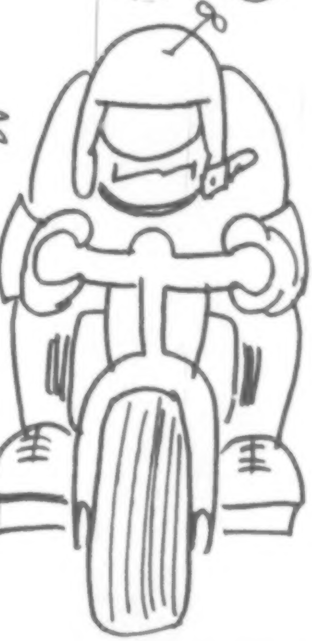


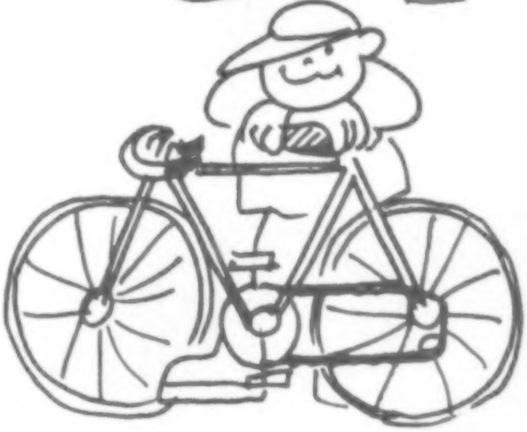








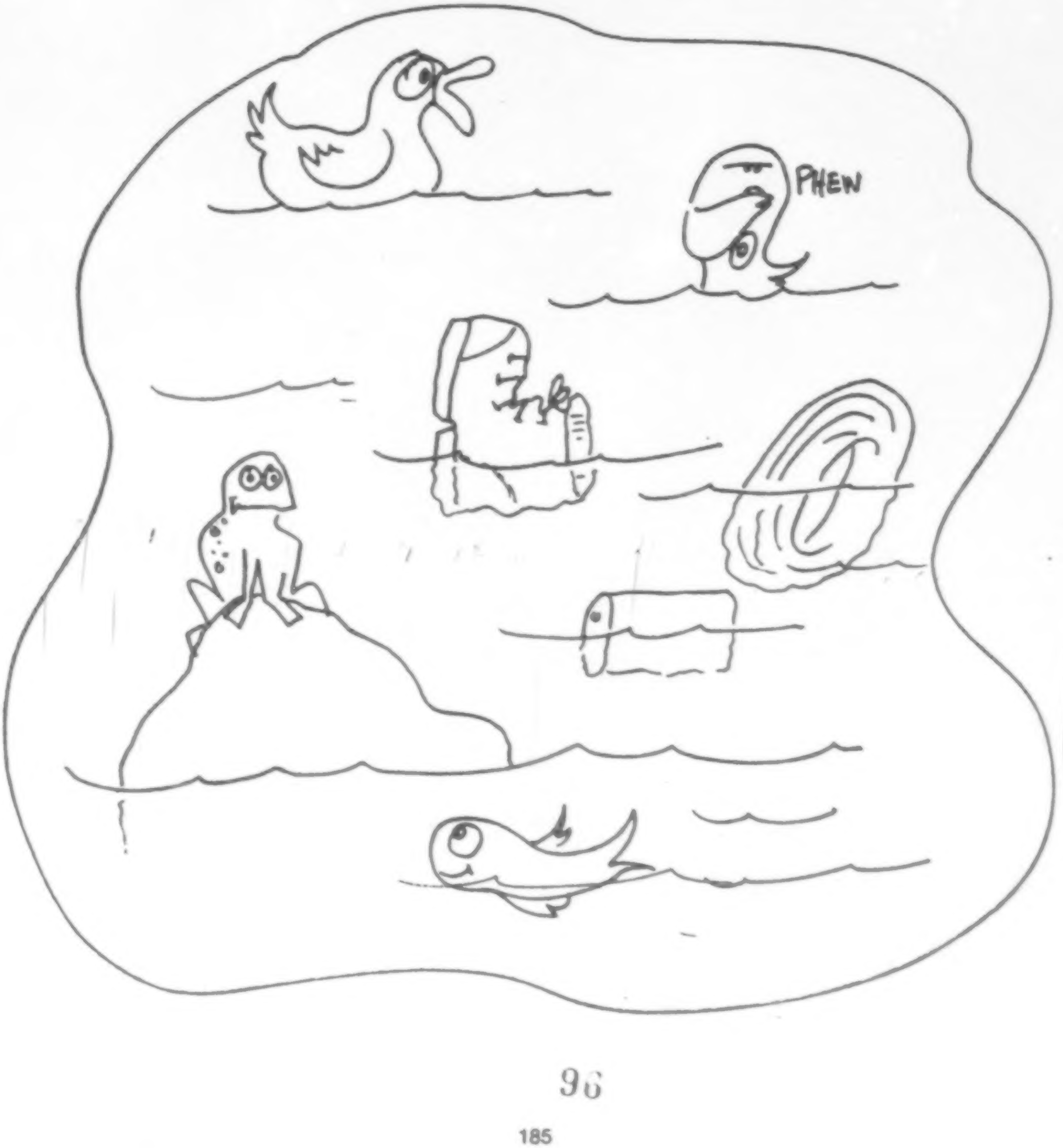




Name ________________________________

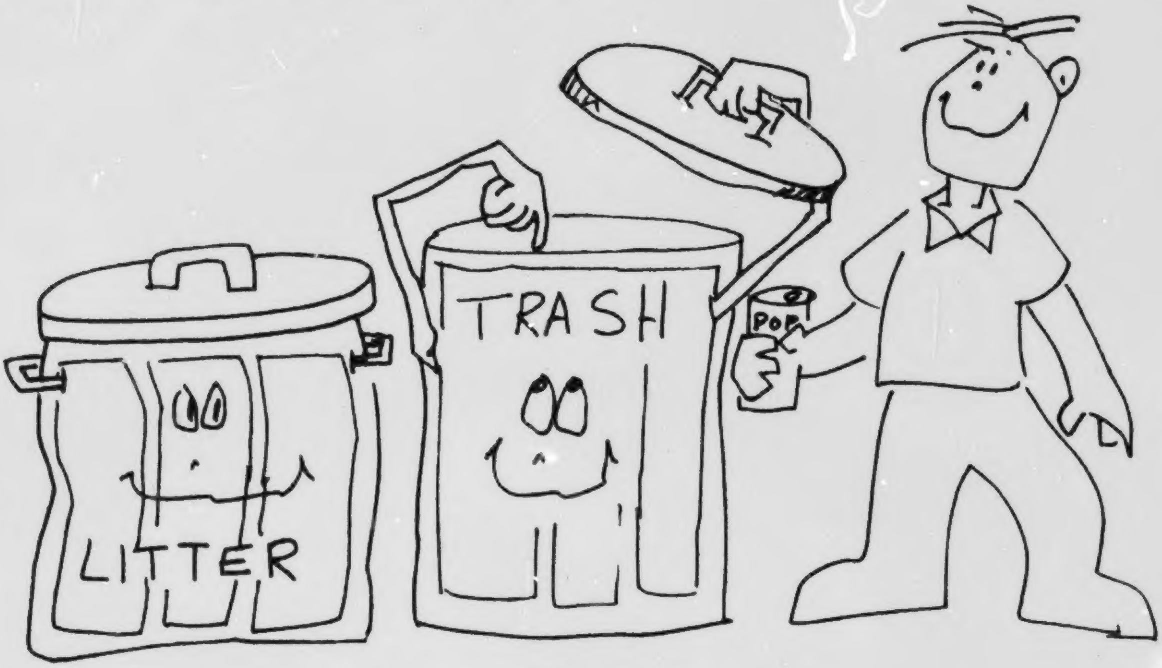
Trash and litter do not belong in the water. They make the water polluted. Polluted water looks bad, smells funny, and can make you sick.

Directions:
Put an X on the things that do not belong in the water.



Name ______________________________

Here are some ways we can keep our environment clean.



Draw a line under two things that will help keep our land clean.

1. Pick up litter.
2. Wash the rocks.
3. Use a trash can.

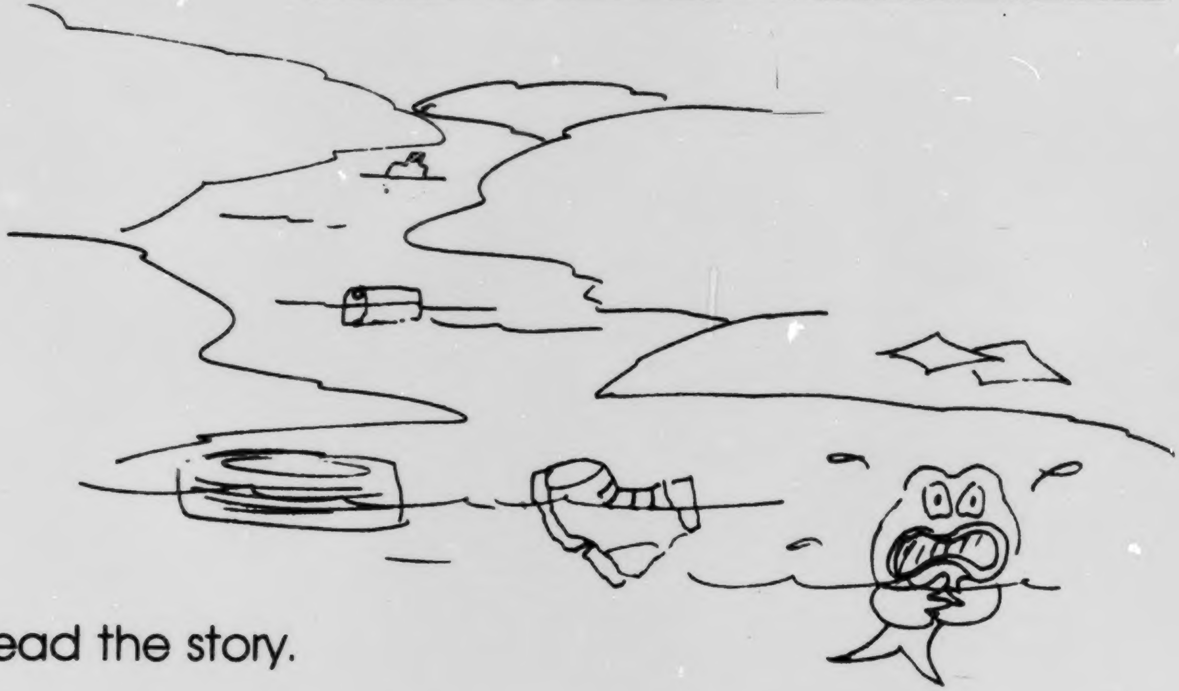
Draw a line under two things that will help keep our air clean.

1. Don't burn trash.
2. Walk, instead of riding in a car.
3. Paint the sky blue.

Draw a line under two things that will help keep our water clean.

1. Drink soda pop.
2. Don't throw bottles or cans in rivers.
3. Don't put trash in lakes.

Name ______________________________



Read the story.

Much of our water is dirty or polluted. Some dirt comes from homes and factories. People throw trash in and near water. Oil and trash from ships make water dirty, too.

Plants and animals need clean water to live.

Directions: Choose the correct word to complete each sentence.

ships trash factories animals

1. Oil from ______________ can make the water dirty.
2. Much dirt comes from ______________________ .
3. We should not throw ______________ in or near water.
4. Plants and ______________ need clean water to live.

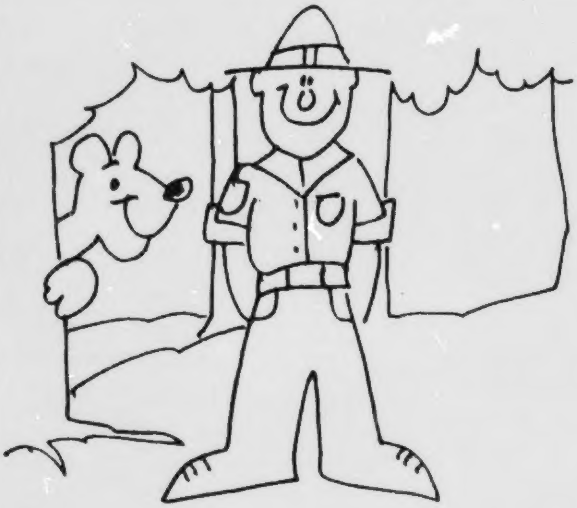
Name

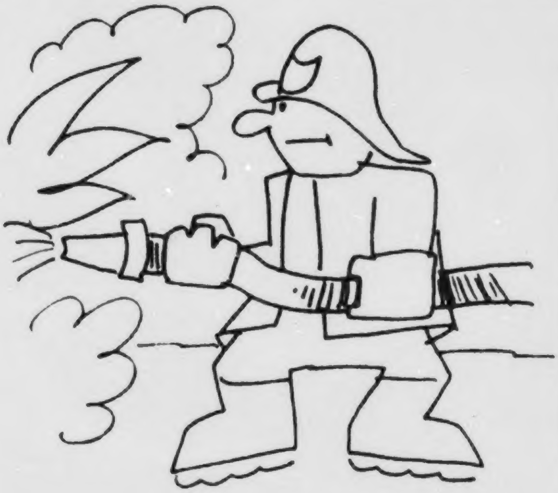
Many people work to keep our environment clean.

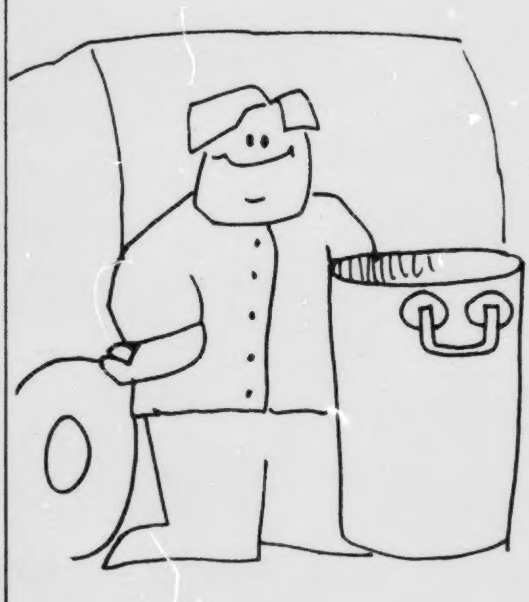
Directions:
Write the name for each person under his picture.

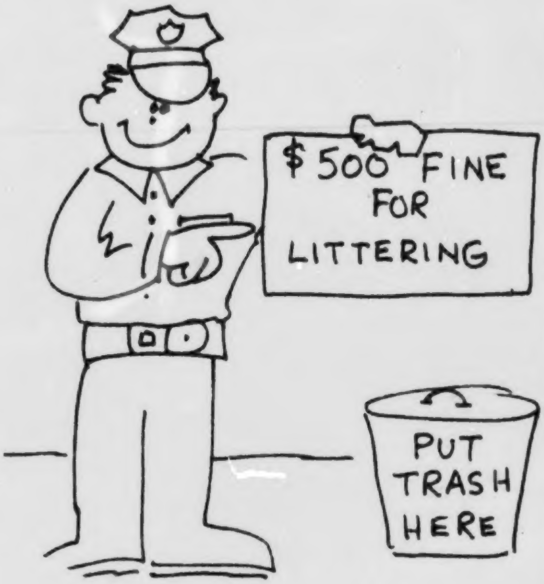
Forest ranger
Fireman

Garbage man
Policeman



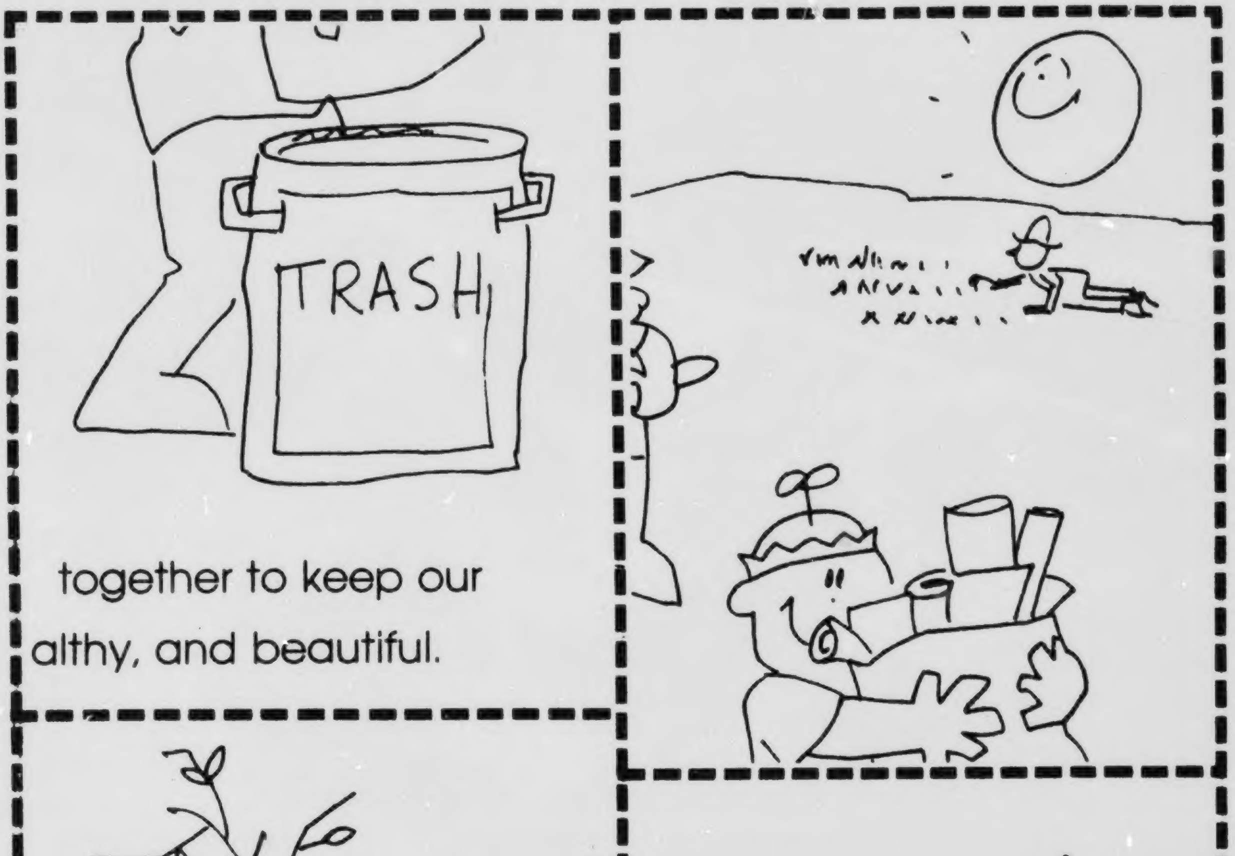





$500 FINE FOR LITTERING
PUT TRASH HERE

Name ______________________________

Directions: Cut out the pieces on the dotted lines. Put the puzzle together. Color it.

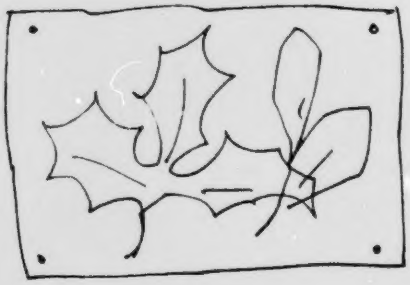

TRASH
together to keep our
althy, and beautiful.
We all need to work
environment clean, he

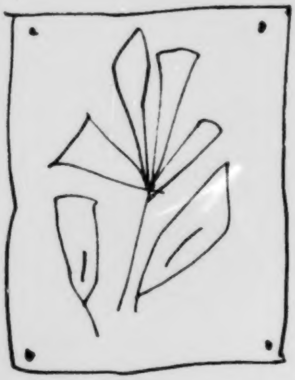
RELATED ACTIVITIES

The following pages are ideas for integrating conservation activities with areas of the curriculum other than language arts, math, social studies and science. These activities are samples of those included in the 'All Levels' Guide which is the seventh book of the Conservation For Children series.

The 'All Levels' Guide contains activities and ideas for art, music, growing plants, and classroom projects, as well as student and teacher bibliographies. The activities and ideas are applicable to many grade levels.

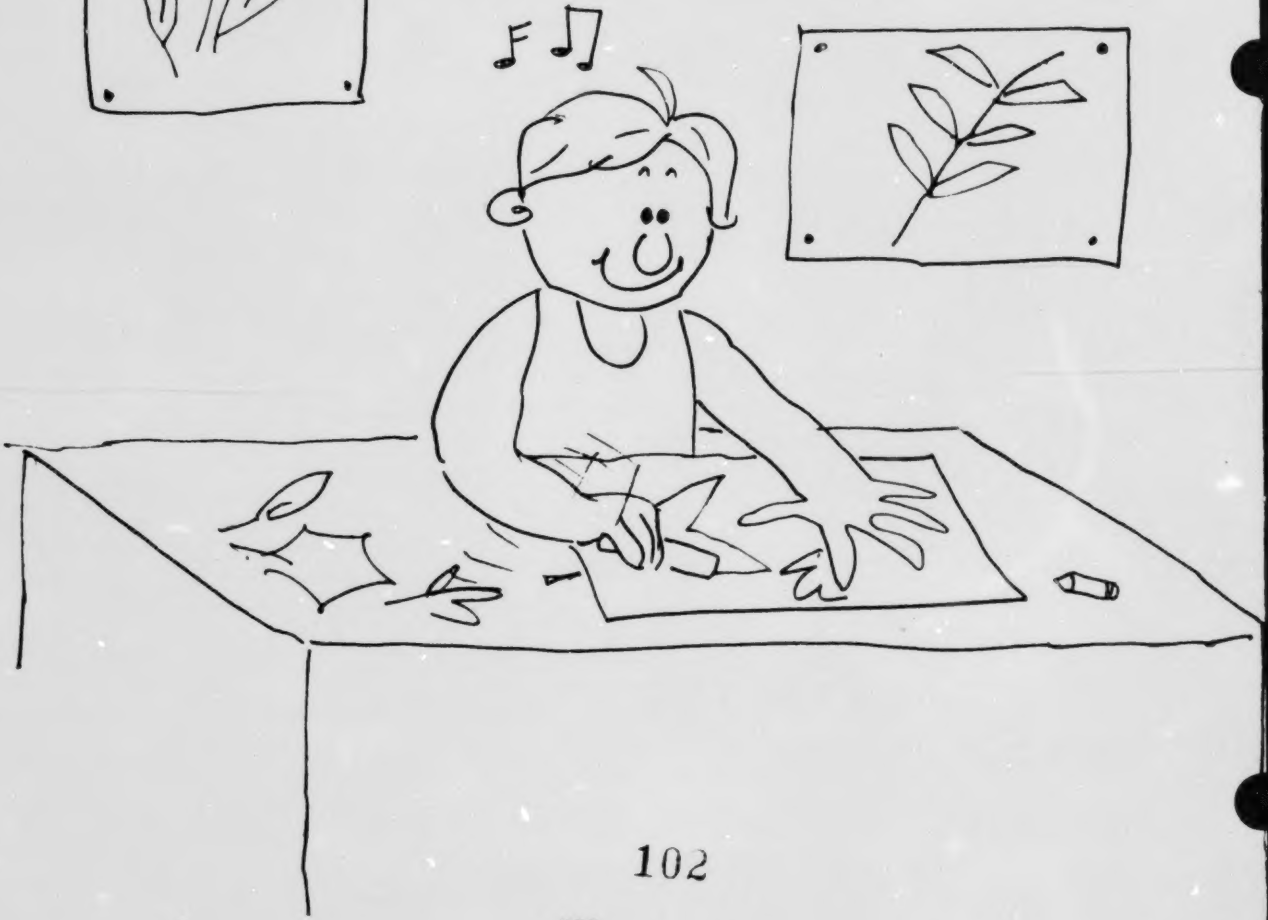
Nature Prints





Gather leaves, grasses, or flowers that have interesting shapes. Place a single leaf or a group of things on the desk, underside up. Cover it with a piece of paper. Tape the paper to the desk with masking tape. Rub over the leaf with the side of a crayon or crayons to make the print. Carefully remove the tape.

Use the nature prints to make wrapping paper, stationery, place cards or pictures for the wall.



EGG CARTON JEWELRY

Things you will need:

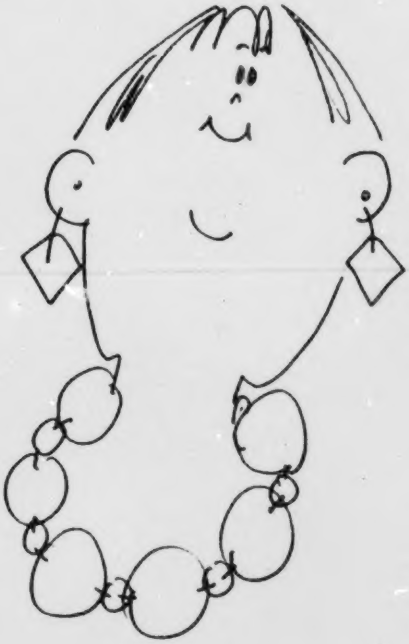
Plastic egg carton lids
Aluminum foil
Cookie cutter or scissors
Paper hole punch
Colored felt pens

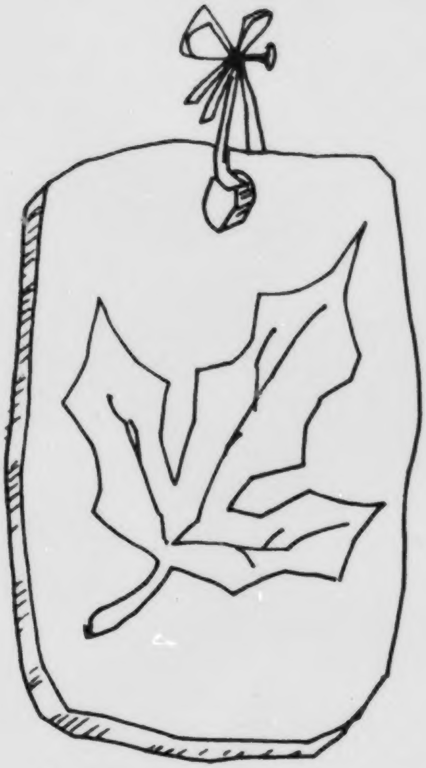
What to do:

1. Press cookie cutter firmly through egg carton lid to make ornaments.
2. Color with felt pens.
3. Punch a hole in the ornament with paper hole punch.
4. Place shapes on a cookie sheet lined with aluminum foil.

   Preheat oven to 375^{0} and bake for about one minute. (To get a hard plastic firmness, shrink, wait, and then shrink again.)

   Egg carton shapes shrink about 3/4 of their original size.





LEAF PRINT TILES

Materials:

Ceramic clay
Assortment of leaves
Rolling pin or dowel
Knife
Two strips of wood, about ½ in. thick
Newspaper or oil cloth

Directions:

1. Roll clay flat between two strips of wood.
2. Arrange leaf or leaves on clay slab, vein sides down.
3. Run the rolling pin over the leaves to press them into the clay.
4. Use knife to cut out tiles (or free form shapes).
5. Allow to dry for about a week. There is no need to remove leaves as they will dry and curl up. Pieces that may remain will burn away during firing.
6. When thoroughly dry, fire in kiln.
7. Glaze, if desired, and refire.

These tiles make good hot plates, spoon holders and can also be combined to make effective murals. You can even make a hole, while clay is wet, and hang them on the wall.

EGGHEADS

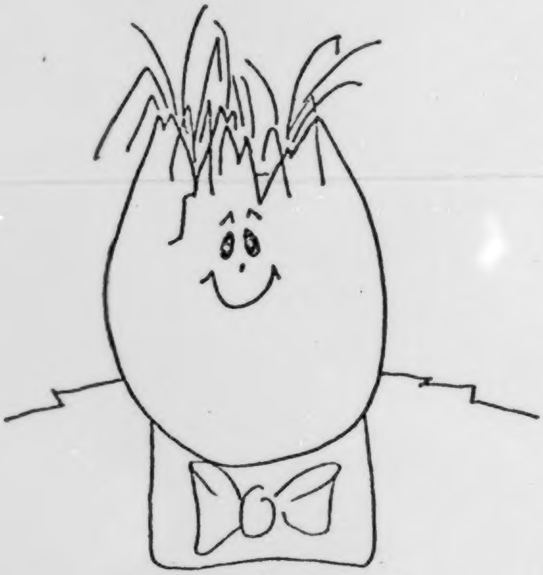
Growing sprouts (bean, grass, bird seed, etc.) is a fast method of helping children to understand that all plants need water to grow.

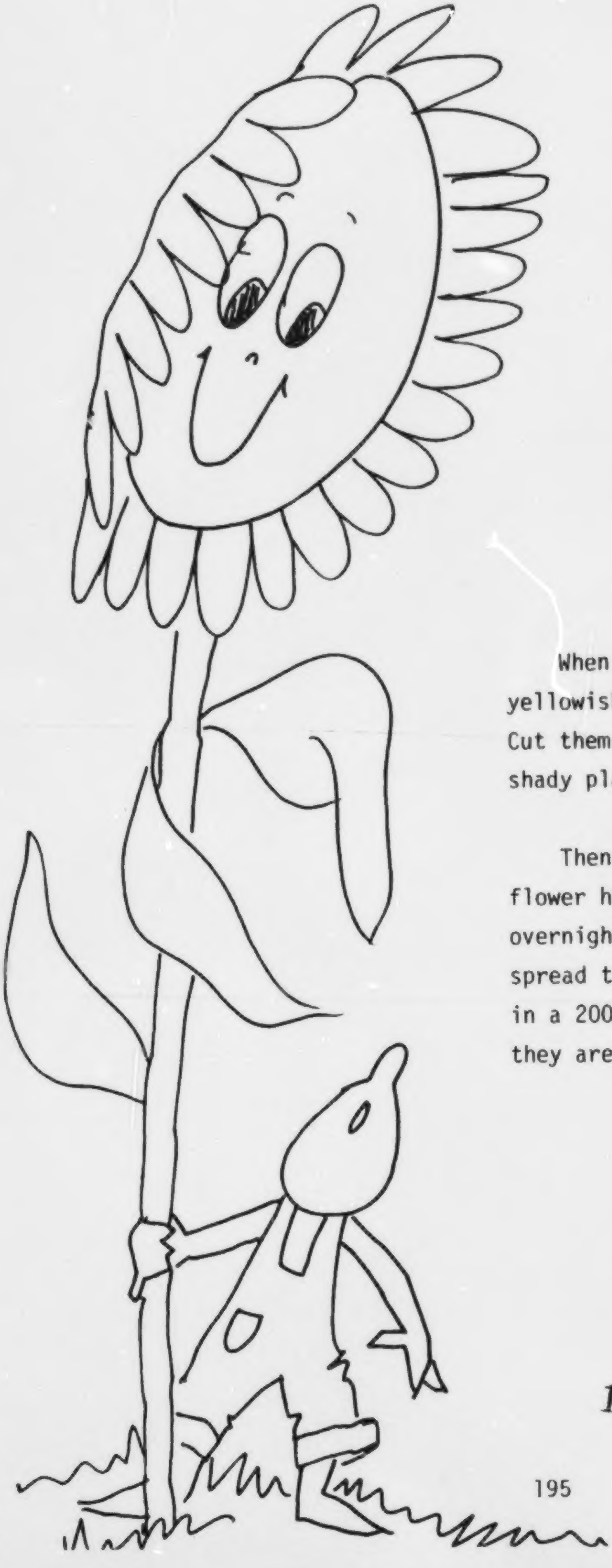
Making eggheads adds fun and excitement to the process.

Here's what to do.

Have the children bring in egg shells that are 3/4 whole. Have extras on hand as some will surely break during the decorating session. Make faces on the shells with felt tip pens or poster paint, keeping the open end of the egg facing up. When the faces dry, carefully fill the shells with planting mix. It should go all the way to the top edges of the shell. Sprinkle grass seed evenly over the surface and pat gently into the soil. Water them carefully but generously. Put your eggheads in an egg carton and place them by a sunny window. Before long, every baldy will be sporting a crop of healthy, green hair!

For extras you can use paper tubes from bathroom tissue or paper towels to make individual holders. Children can decorate the tubes with collars, ties, shirts, jewelry or whatever they choose.



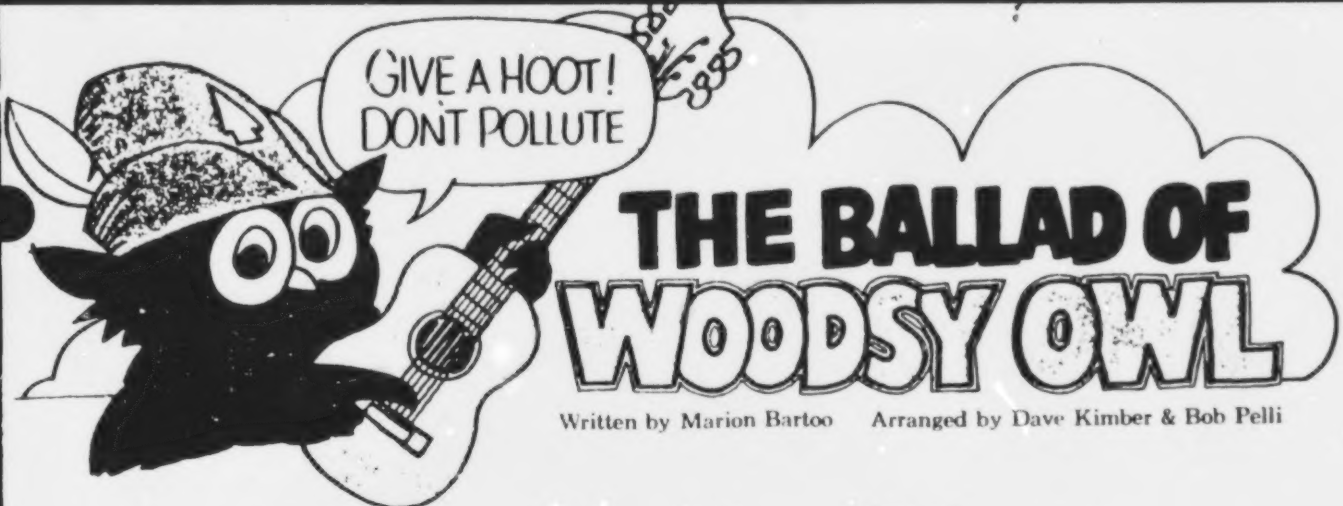


SUNFLOWERS

Sunflowers are easy to grow. Choose a place in your yard where there is sunshine most of the day. Dig a little hole and plant the seeds about ½ inch deep. If you are planting several, keep them about one foot apart. Water them well and in about two weeks the seeds will sprout.

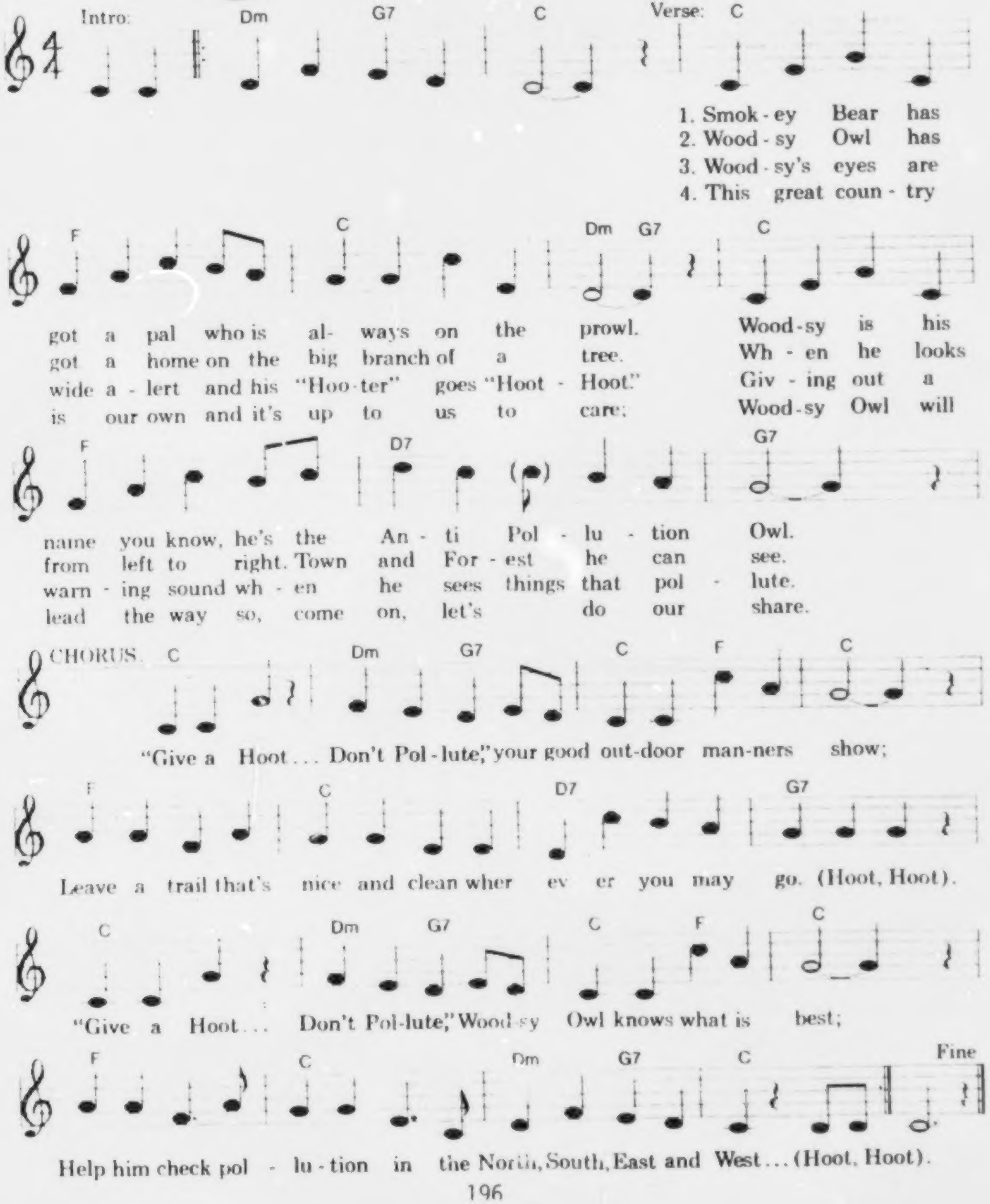
When the backs of the flowers turn yellowish, they are ready to be harvested. Cut them and hang them up to dry in a cool, shady place for two or three days.

Then remove the dried seeds from the flower heads and soak them in saltwater overnight. The next day drain them and spread them on a cookie sheet. Roast them in a 200 degree oven for 1½ hours or until they are crisp.


GIVE A HOOT!
DON'T POLLUTE

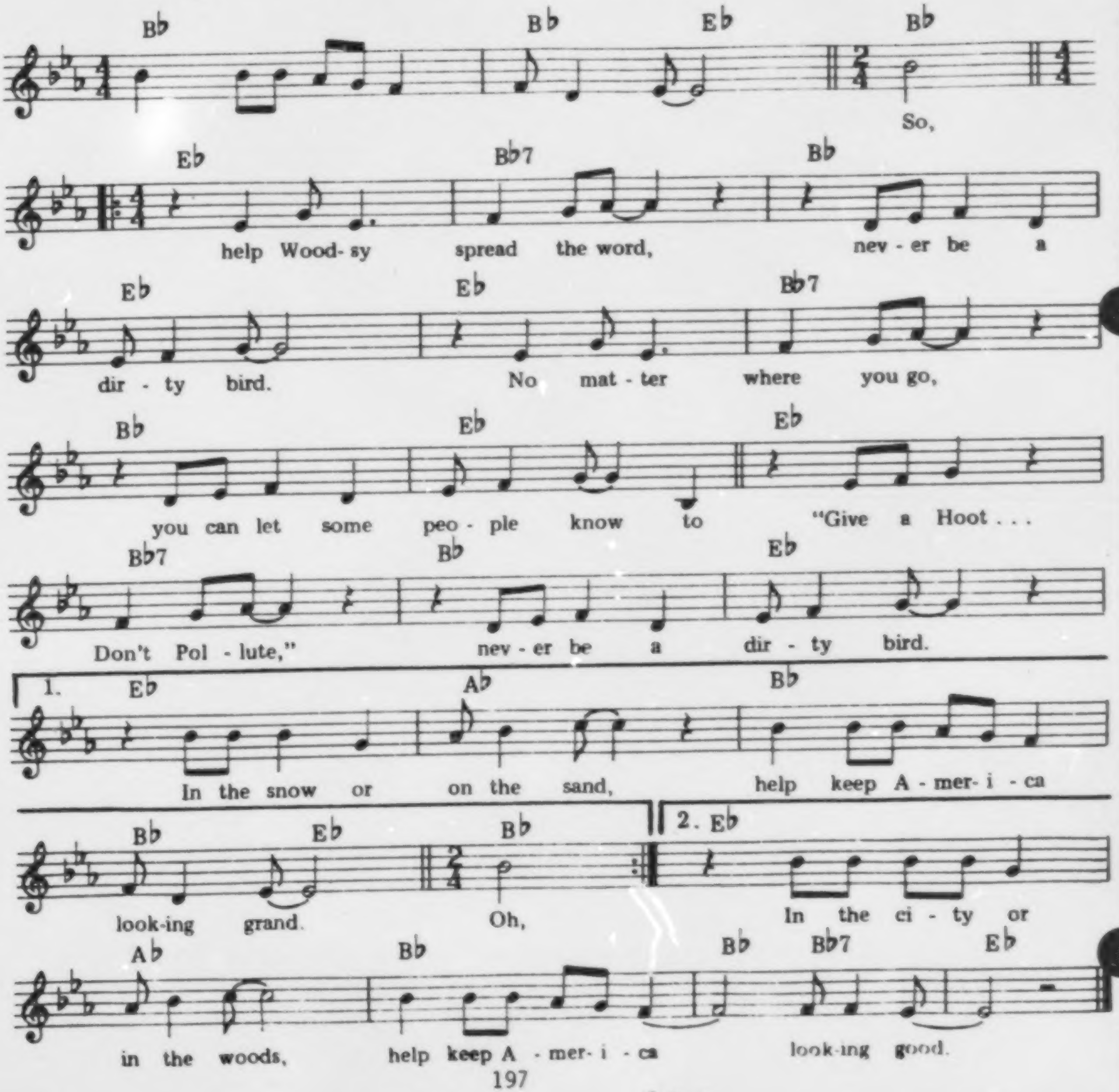
THE BALLAD OF WOODSY OWL

Written by Marion Bartoo Arranged by Dave Kimber & Bob Pelli


Intro:
Dm G7 C
Verse: C
1. Smok-ey Bear has got a pal who is al- ways on the prowl. Wood-sy is his name you know, he's the An-ti Pol-lu-tion Owl.
2. Wood-sy Owl has got a home on the big branch of a tree. Wh-en he looks from left to right. Town and For-est he can see.
3. Wood-sy's eyes are wide a-lert and his "Hoo-ter" goes "Hoot-Hoot." Giv-ing out a warn-ing sound wh-en he sees things that pol-lute.
4. This great coun-try is our own and it's up to us to care; Wood-sy Owl will lead the way so, come on, let's do our share.
F C Dm G7 C
F D7 G7
CHORUS. C Dm G7 C F C
"Give a Hoot . . . Don't Pol-lute," your good out-door man-ners show;
F C D7 G7
Leave a trail that's nice and clean wher ev er you may go. (Hoot, Hoot).
C Dm G7 C F C
"Give a Hoot . . . Don't Pol-lute," Wood-sy Owl knows what is best;
F C Dm G7 C Fine
Help him check pol-lu-tion in the North, South, East and West . . . (Hoot, Hoot).

Give a hoot! Don't pollute!

Help Woodsy spread the word...


Bb Bb Eb Bb
So,
Eb Bb7 Bb
help Wood-sy spread the word, nev-er be a
Eb Eb Bb7
dir-ty bird. No mat-ter where you go,
Bb Eb Eb
you can let some peo-ple know to "Give a Hoot...
Bb7 Bb Eb
Don't Pol-lute," nev-er be a dir-ty bird.
1. Eb Ab Bb
In the snow or on the sand, help keep A-mer-i-ca
Bb Eb Bb 2. Eb
look-ing grand. Oh, In the ci-ty or
Ab Bb Bb Bb7 Eb
in the woods, help keep A-mer-i-ca look-ing good.

Things to Send For . . .

Many people are working together to keep our land beautiful. They will send you things so that you can learn how, too.

The Forest Service has two kits for children. One is the Woodsy Owl Kit which has decals, a bookmark, a picture of Woodsy, dot to dot activities, and lots of ideas on how you can help the environment. The other one is the Smokey Bear Junior Forest Ranger Kit. It tells how to be a junior forest ranger and has songs, pictures, a badge, and a junior ranger certificate. Both kits are free. If you would like one, write to:

The Forest Service, USDA
P.O. Box 2417
Washington, D.C. 20013

Ask for the Woodsy Owl Kit or the Smokey Bear Junior Forest Ranger Kit.

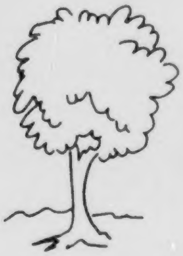
109

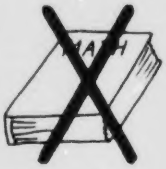
CHILDREN'S BOOKS FOR PLEASURE and INFORMATION

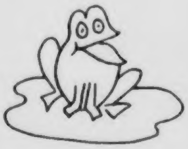
1. Aliki. GREEN GRASS AND WHITE MILK. Thomas Crowell, New York, 1974.
2. Berenstain, Stan and Jan. BEAR'S NATURE GUIDE. Random House, New York.
3. Berenstain, Stan and Jan. BERENSTAIN BEARS' SCIENCE FAIR. Random House, New York.
4. Binzen, Bill. MIGUEL'S MOUNTAIN. Coward-McCann, Inc., 1968.
5. Burton, Virginia Lee. THE LITTLE WHITE HOUSE. Houghton-Mifflin, Boston.
6. Chargin, Claudia. IT'S YOUR WORLD. Troubador Press.
7. Gabel, Margaret. SPARROWS DON'T DROP CANDY WRAPPERS. Dodd, Mead and Co.
8. Gans, Roma. WATER FOR DINOSAURS AND YOU. Thomas Crowell Co., New York, 1972.
9. Goudey, Alice E. THE GOOD RAIN. Dutton, Inc., New York, 1950.
10. Krauss, Ruth. THE CARROT SEED. Scholastic Book Services, New York, 1972.
11. Leaf, Munro. WHO CARES? I DO. J.B. Lippincott, Philadelphia.
12. McCloskey, Robert. MAKE WAY FOR DUCKLINGS. Viking Press, New York, 1941.
13. Peet, William. THE WUMP WORLD. Houghton-Mifflin, Boston, Mass.
14. Peet, William. FAREWELL TO SHADY GLADE. Houghton-Mifflin, Boston, Mass.
15. Pomerantz, Charlotte. THE DAY THEY PARACHUTED CATS ON BORNEO. Addison-Wesley, 1971.
16. Ruchlis, Hyman. THANK YOU MR. SUN! Harvey House.
17. Seuss, Dr. THE LORAX. Random House.
18. Silverstein, Shel. THE GIVING TREE. Harper and Row.
19. Tison, Annette and Taylor, Talus. BARBAPAPA'S ARK. Scholastic Book Services.
20.
21.
22.
23.
24.

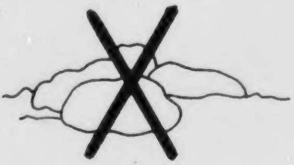
Plants and animals are living things
They need sun, air, soil and water to live.

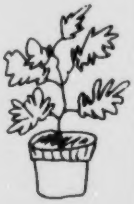
Color the things that are living.
Put an X on the things that are not living.

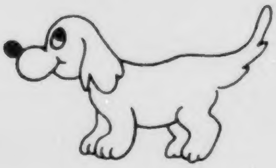


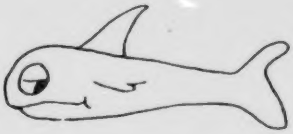






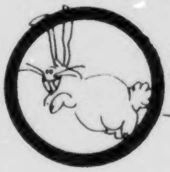




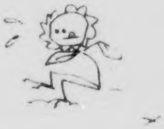


Both plants and animals are living things. They need air, water, sun and soil to live. But, there are some ways they are not alike.

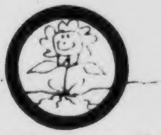
Circle and color the picture that is correct.

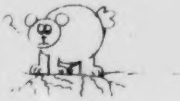


Animals can move.
Some can run and jump.

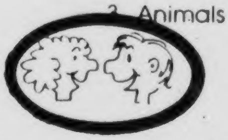


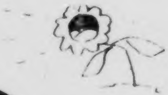
2. Plants have roots.



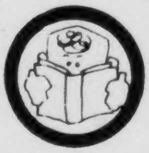


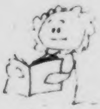
3. Animals can make sounds.





4. Some animals can read a book.





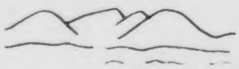
Are you a plant or an animal?

Write the word. animal

Fill in the missing letters.

All plants and animals need.....

sun



soil

water

air

Find the words that tell what all plants and animals need in the "word find".

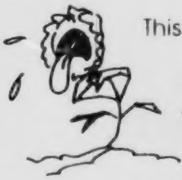
Circle them.

M	S	U	N	W
L	O	X	P	A
A	I	R	L	T
E	L	J	K	E
Z	F	S	I	R

All plants and animals need soil, air, sun, and water.

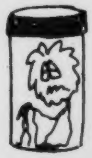
Use these words to fill in the blanks:

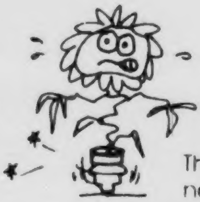
soil air sun water



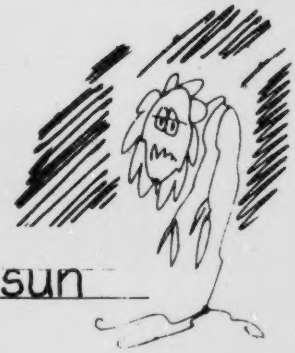
This plant needs more water

This plant needs more air



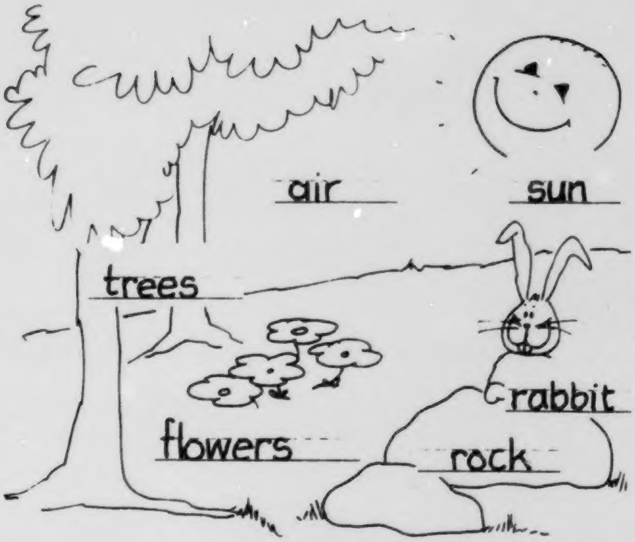


This plant needs more soil



This plant needs more sun

Answers: 110, 112, 113, 114

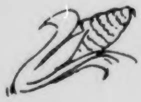


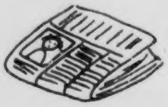
Write the words below on the correct spaces in the picture.

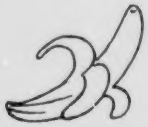
sun	air	trees
flowers	rabbit	rock

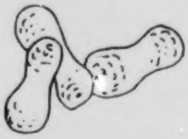
115

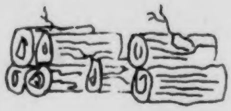
All these things come from plants. Circle the letter that is at the beginning of each word.

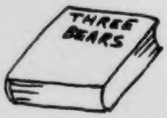

[✓ c] r g


d [✓ n] s

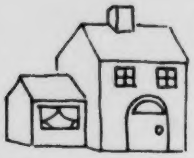

d [✓ b] f

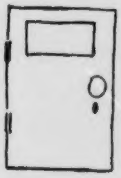

h [✓ p] d


j [✓ w] r



[✓ b] k d

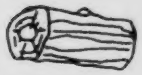

[✓ h] t l

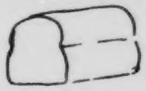

m p [✓ d]

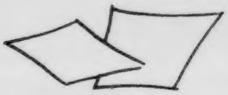
117

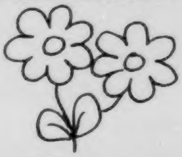
Here are some of the many things we get from plants. Write the word under the picture.

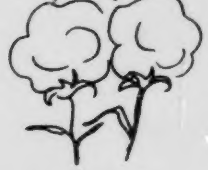
wood	fruit	paper
cotton	flowers	bread

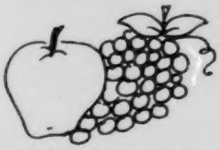

wood


bread


paper

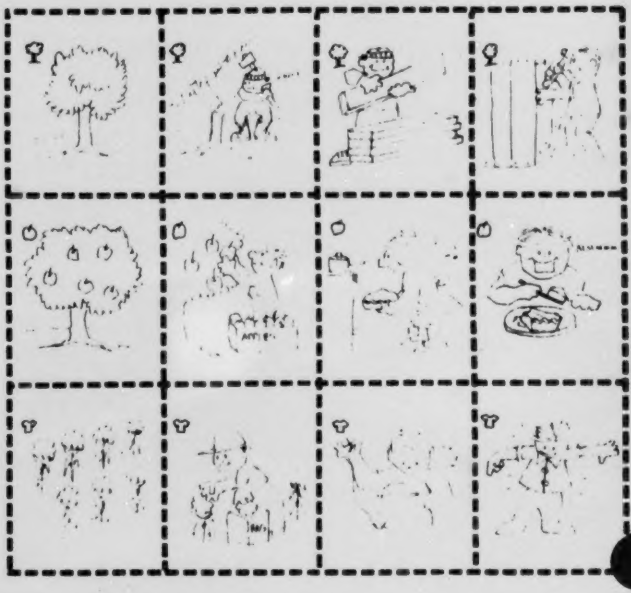

flowers


cotton


fruit

118

People use plants in many ways.
Cut out the pictures on the dotted lines.
Paste them in the right order.



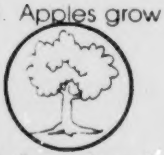
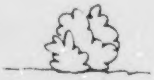
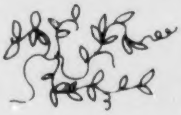
119

Answers: 115, 117, 118, 119

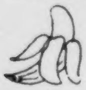
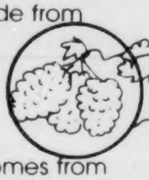
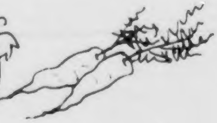
Our food comes from plants.

Circle the correct picture to finish each sentence.

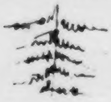
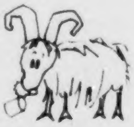
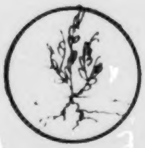
1. Apples grow on a

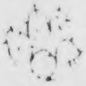
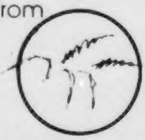
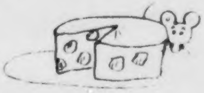
2. Some jam is made from

3. Peanut butter comes from

4. Bread is made from

Use the back of this paper to show where oranges grow.

This is a glass of milk.
Milk does not grow on plants.
It comes from cows.
Cows need plants to eat.

This is an egg.
Eggs do not grow on plants.
Hens lay eggs.
Hens need plants to eat.

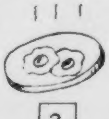
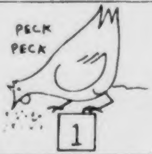
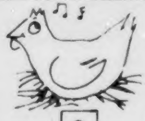
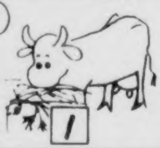
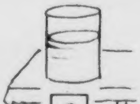
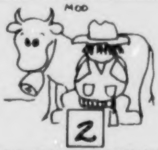
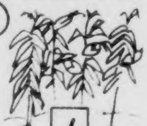
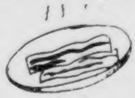
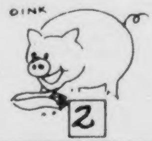
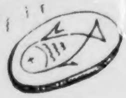
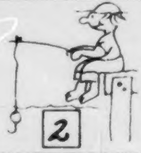
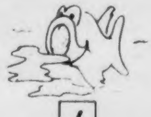
Draw lines to finish the sentence.

Milk comes from	plants.
Eggs come from	cows.
Hens eat	eggs.
Cows eat	plants.
Hens lay	hens.

All of our food comes from plants.

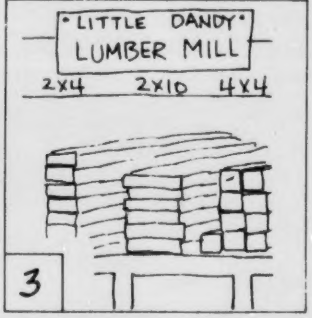
Put the number 1, 2 or 3 in the boxes in each row to show how this happens.

Example

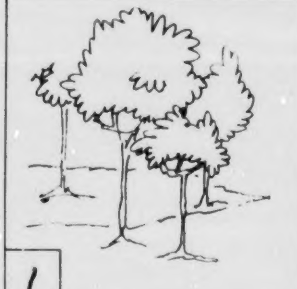
 3	 1	 2
①  1	 3	 2
②  1	 3	 2
③  3	 2	 1

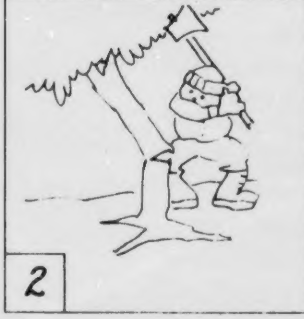
We get many things from plants.
Trees are plants.
We get wood from trees.

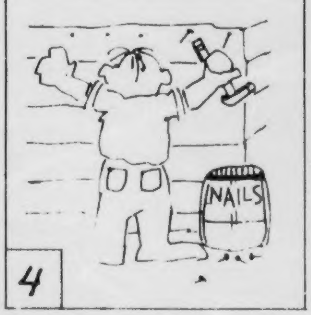
Put 1, 2, 3 or 4 to show how a tree becomes a house.



3

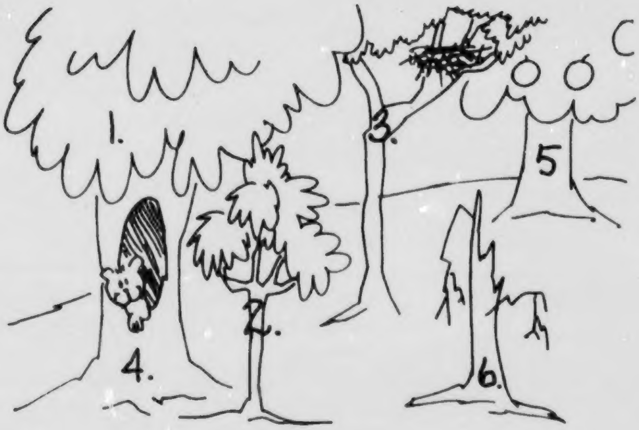

1


2



4

Answers: 120, 121, 122, 123

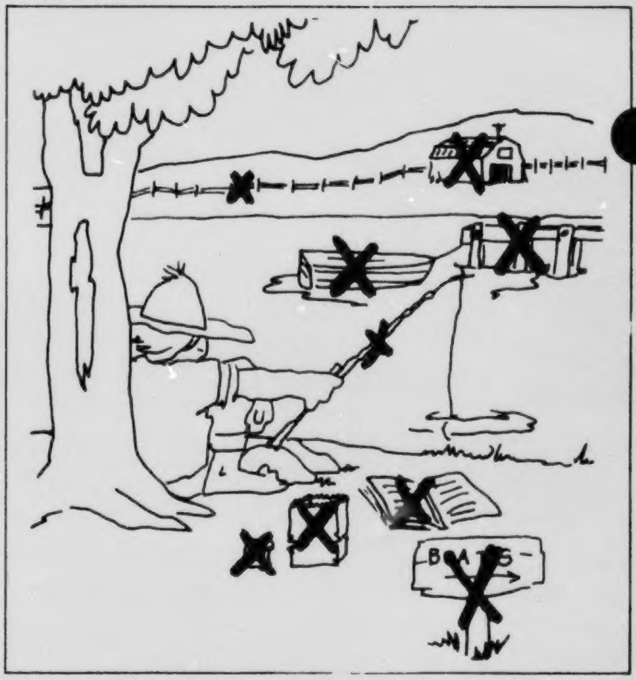


Put the numbers on the trees that the sentences tell about.

1. This tree is very big.
2. This tree is little.
3. There is a nest in this tree.
4. Someone lives inside this tree.
5. This tree gives us something to eat.
6. This tree is not alive.

Color the picture.

124

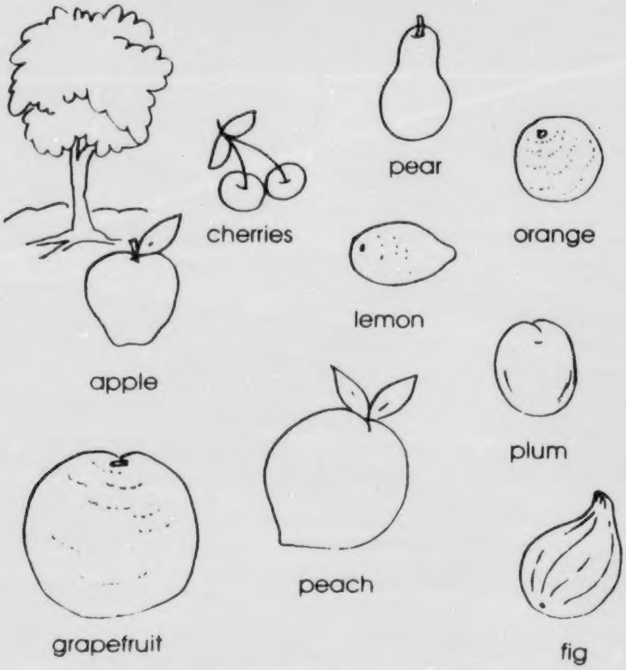


Trees give us many things.

Put an X on all the things in the picture that we can get from trees.

125

Many plants have fruit that we can eat.
These fruits grow on trees.
What color are they? Color them.


pear
cherries
orange
lemon
apple
plum
peach
grapefruit
fig

126

Animals help us in many ways.

Draw a line from the sentence to the picture it tells about.

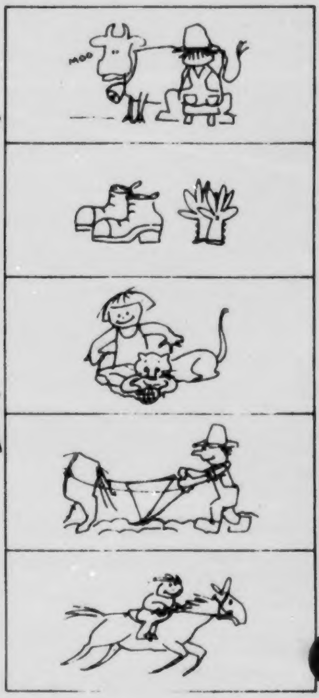
Animals can help us work.

Some animals give us food.

Animals also give us things to wear.

Many people have animals for pets.

You can ride on some animals.

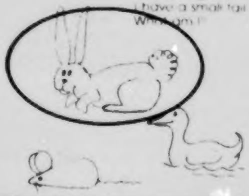


128

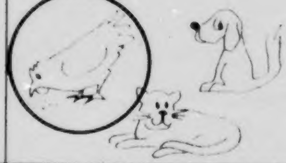
Answers: 124, 125, 126, 128

Draw a circle around the right animal

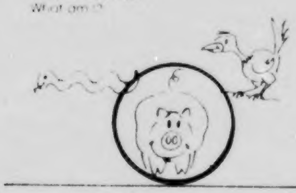
I am small and furry
I have long ears
I have a small tail
What am I?



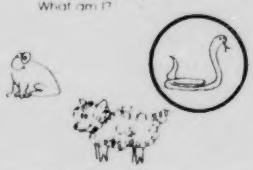
I am white
I have feathers
I lay eggs
What am I?



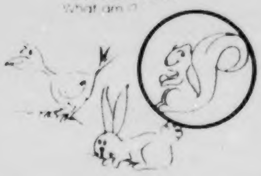
I am fat
I have four legs
I have a curly tail
What am I?



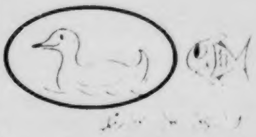
I do not have fur or feathers
I am thin and long
I do not have legs
What am I?



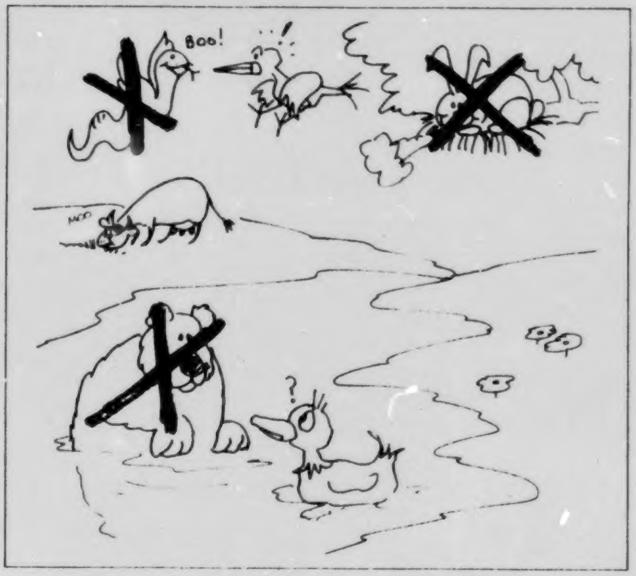
I can live in a tree
I have a big furry tail
I like to eat seeds
What am I?



I like to swim in the water
I can lay eggs, too
I have feathers
What am I?



129



Each animal has its own habitat, or place where it lives best.

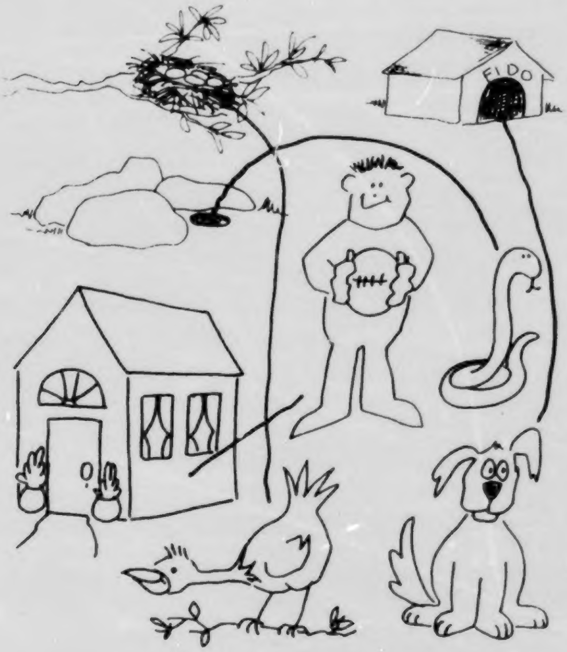
Three of these animals are in the wrong places. Put an X on the ones that are not in their own habitats.

Color the picture.

130

Habitat: Natural home of the animal.

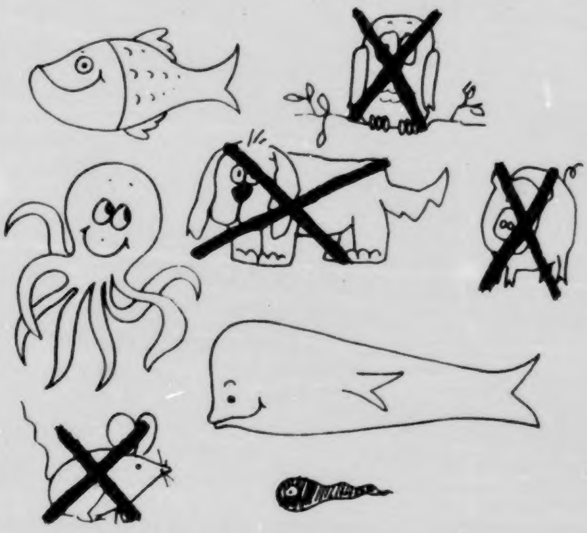
Draw a line from each animal to its habitat.



131

We need water to drink. But we could not live in water. Water is a good home for many plants and animals.

Some of these animals live in water. Color the ones that do live in water. Put an X on the ones who do not live in water.

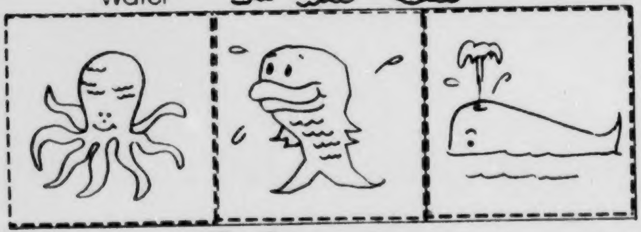


132

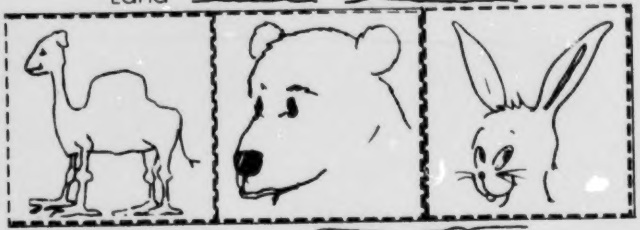
Answers: 129, 130, 131, 132

Environments

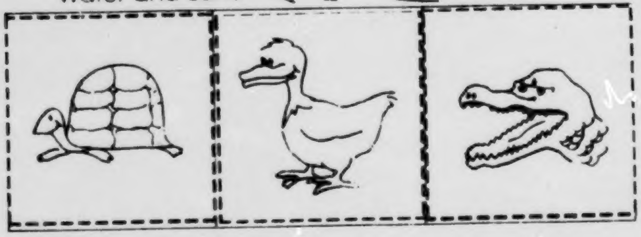
Water



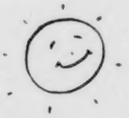
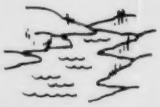
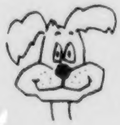
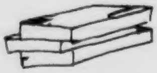
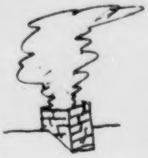
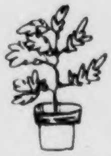
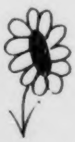
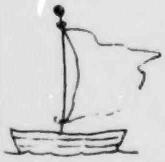
Land



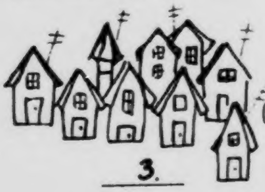
Water and Land



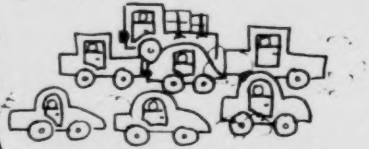
Mark the circle in front of the correct word.

	○ set ● sun ○ saw		○ work ● water ○ blue
	● animal ○ people ○ house		○ window ○ wind ● wood
	● smoke ○ small ○ snake		○ plate ○ pail ● plant
	● flower ○ fun ○ flag		○ stop ○ shoe ● sail

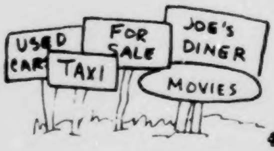
When the air, soil and water are dirty, we say they are polluted.
Here are some kinds of pollution.



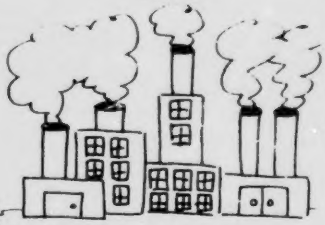
3.



1.



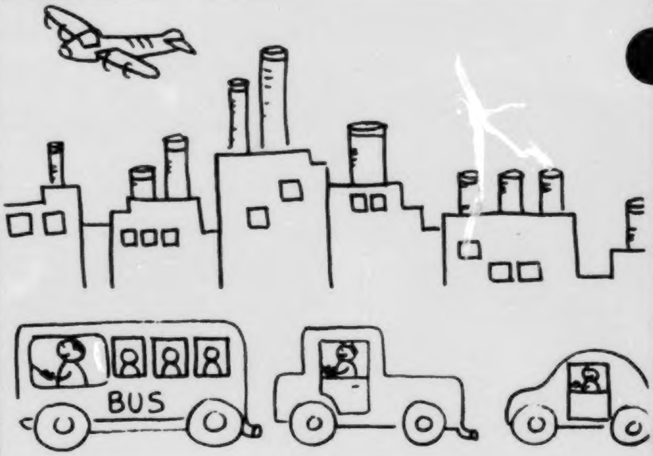
4.



2.

Read the sentences. Write the numeral under the right picture.

1. This shows too many cars.
2. This is how factories pollute our air.
3. This shows too many houses.
4. This is not nice to look at.



- ☐ Make smoke coming from all the chimneys.
- ☐ Put smoke coming out of the vehicles.
- ☐ Color the bus yellow.
- ☐ Make the truck red.
- ☐ Color the plane blue.
- ☐ Draw smoke coming from the plane.
- ☐ What color will the sky be? Color it.

Answers: 134, 135, 136, 137

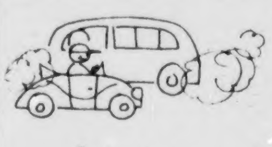
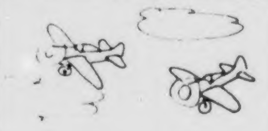
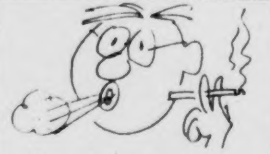
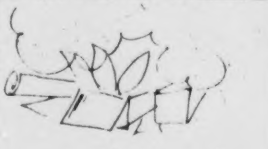
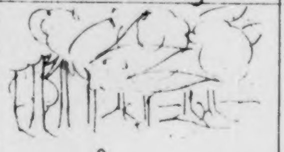
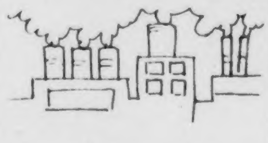
Here are some things that can make the air dirty.

Directions:
Write the words under the correct picture.

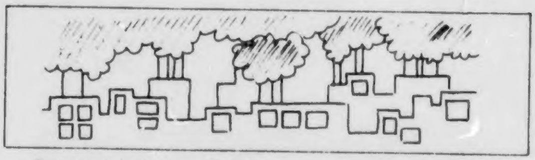
trash
smoke

cars
fires

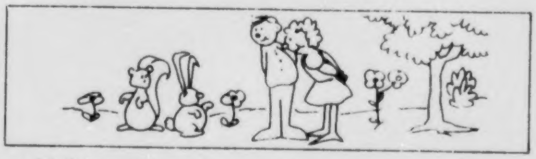
airplanes
smoking

 cars	 airplanes
 smoking	 burning trash
 forest fires	 smoke from factories

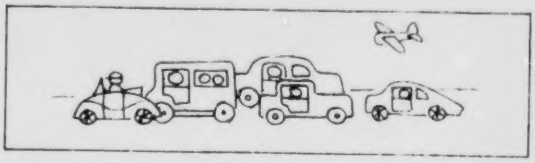
Draw a line under the sentence that tells about the picture.

1. 

Fire is bad for plants.
[✓ Smoke makes the air dirty.]

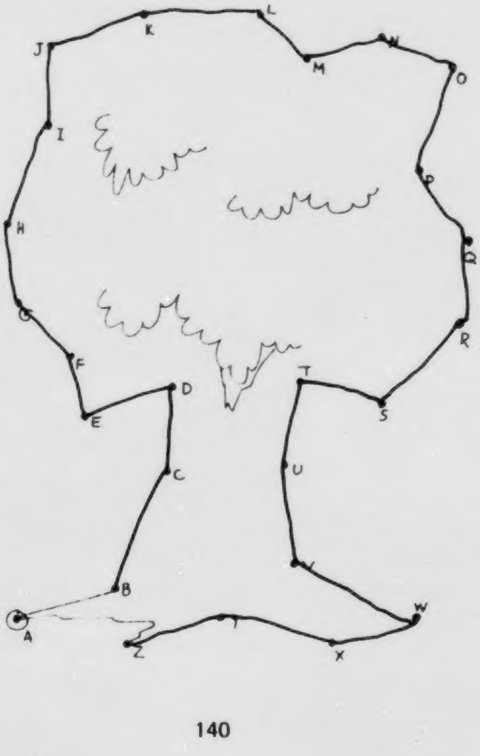
2. 

[✓ All living things need air.]
Bears are big animals.

3. 

We like to ride in cars and airplanes.
[✓ Cars and airplanes make the air dirty, too.]

Connect the dots to see what gives us clean air to breathe.



Write the letter that comes next.

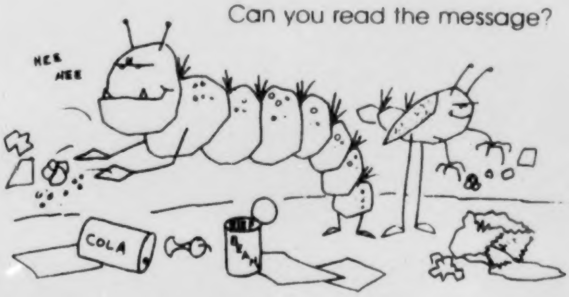
A B C D
L M N O
K L M N
Q R S T

– – A B
B C D E

A

I J K L
F G H I
Q R S T
Q R S T
B C D E
O P Q R
– – A B
R S T U
D E F G!

Can you read the message?



Answers: 138, 139, 140, 141

If you don't want to be a litterbug, where should you put your paper wrappers?

Fill in the missing letters to find out.

G H L J K
L M N O P

R S T U V
F G H I J
C D E F G

R S I U V
P Q R S T
A B C
Q R S T U
F G H I J

A B C D E
A B C
L M N O P

Write the letters that you wrote on the spaces below.

IN THE TRASH CAN

Draw a circle around the word that does not belong in the sentence.

1. All living things need [✓ we] water.
2. Dirty water is not [✓ need] good.
3. It [✓ clean] can make you sick.
4. Keep our [✓ water] water clean.

Write the words that you circled in the boxes.

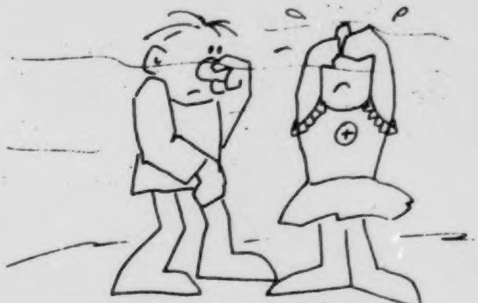
1. WE
2. NEED
3. CLEAN
4. WATER

Draw a line under the correct word in each sentence.

Dan and Sue are [✓ helping] helpping to keep the air clean.

Dan [✓ walks] wolks to school.

Sue rids a [✓ rides] bike to school.



"The sky looks brown today," said Tom.
"What is making the air so dirty?" asked Jane.
"Too many cars are putting smoke into the air," said Tom.
"I wish there were not so many cars," said Jane. "Then the air would be cleaner."

Answer the questions.

What color was the sky?

○ blue
☒ brown
○ white

What made the air dirty?

☒ too many cars
○ too many dogs
○ Tom and Jane

What did Jane want?

○ the air to be dirty
○ more cars
☒ the air to be cleaner

Answers: 142, 143, 144, 145

Choose the right answer.

We want to keep the park clean. Throw your papers into the ____.

○ lake

● trash can

○ swings

We should take care of plants. Do not put nails into ____.

● trees

○ flowers

○ fences

John and Bob were cleaning up the campground. They picked up ____.

○ trees

○ squirrels

● papers

Fish cannot live in dirty water. Don't throw papers into ____.

○ cars

● rivers

○ fires

All living things need water. We should be careful not to ____ it.

○ drink

● waste

○ save

Cars can make the air dirty. If you can ____ to school.

○ ride

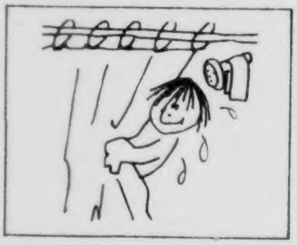
○ fly

● walk

146

Here are some ways you can help our environment.

Put a mark in the circle in front of the best word.



Taking a ☒ short / ○ long shower will save water.

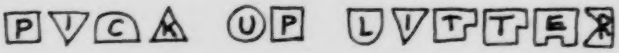
Turning ○ on / ☒ off the lights when you leave the room will save energy.

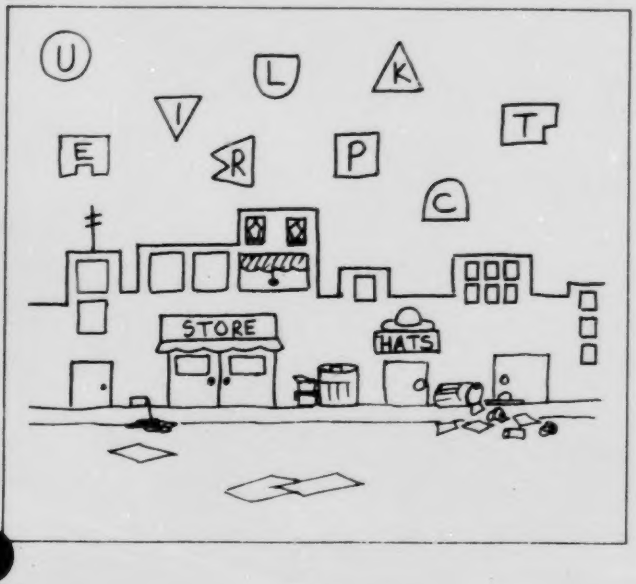
☒ Walking / ○ Riding to school will save gas.

147

How can we help to stop pollution?

Put the right letter into the right shape to find out.





148

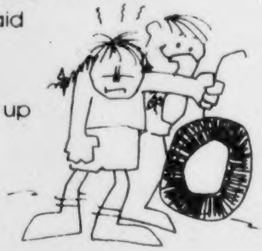
Sue and Billy went fishing. They sat in the shade under a big, green tree.

"I think I have a big fish!" said Sue.

"Pull it in," said Billy.

She pulled and pulled and up came a big, black tire.

"Oh no," cried Sue.



Answer the questions.

Sue and Billy went
○ to the store.
● fishing.
○ to get a tire.

Sue pulled in a
○ big fish.
● big, black tire.
○ big, green tire.

Sue wanted to catch a
● big fish.
○ big, black tire.
○ big, green tree.

How did Sue probably feel?
○ She was happy.
○ She was afraid.
● She was mad.

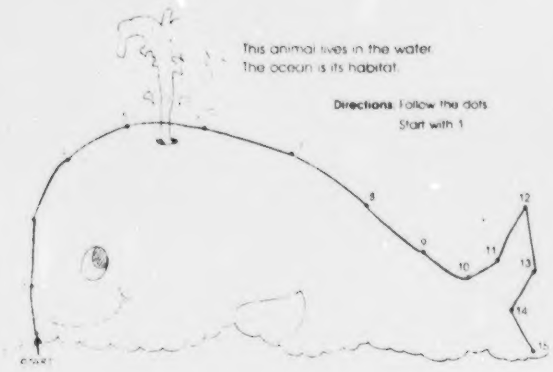
How did the tire probably get into the water?
○ It grew there.
○ The fish put it there.
● Someone threw it in the water.

149

Answers: 146, 147, 148, 149

This animal lives in the water.
The ocean is its habitat.

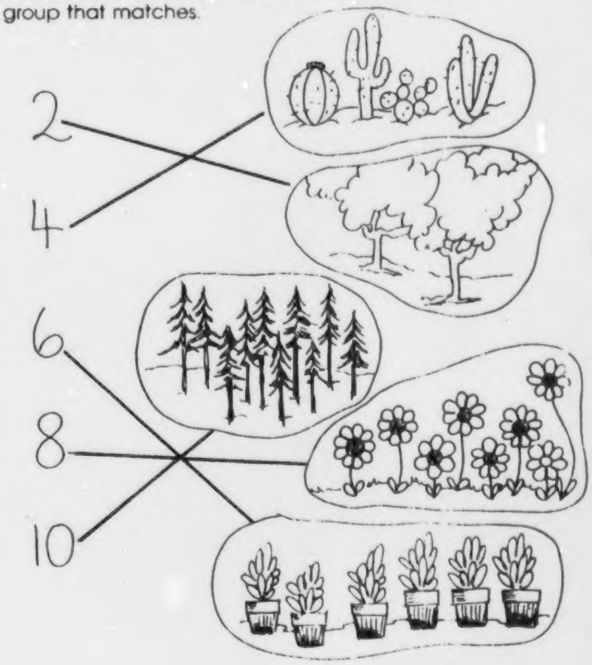
Directions: Follow the dots.
Start with 1


8
9
10
11
12
13
14
15
START

150

Plants are living things.

Directions: Draw a line from the numeral to the group that matches.

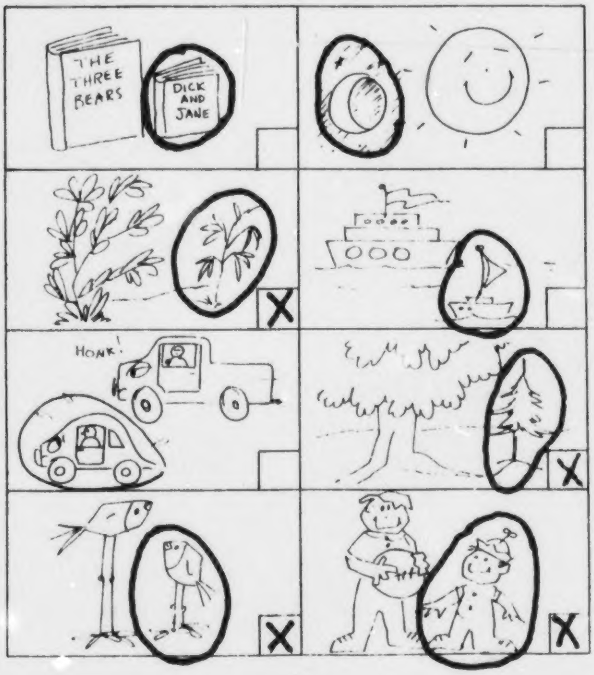


151

Directions:

Circle the smaller one.

Put an X in the ☐ if the things are living.

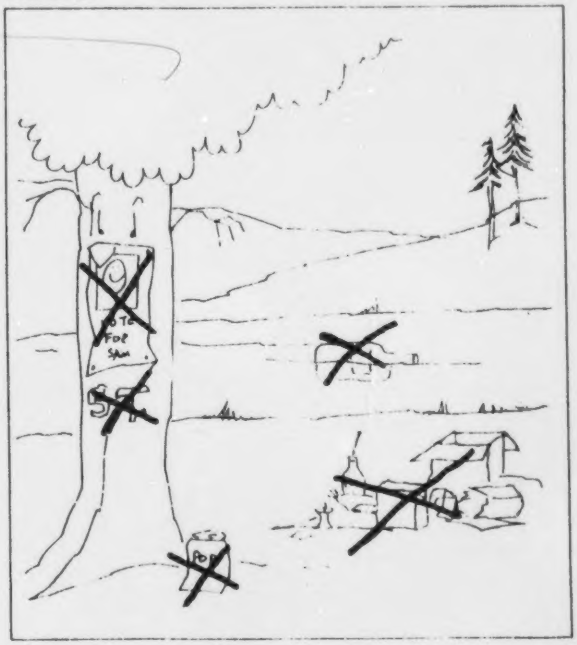

THE THREE BEARS
DICK AND JANE
HONK!
X
X
X
X

152

This playground is not very pretty.

Directions:

Put an X on the things that do not belong there. Can you find all 5?


VOTE FOR SAM
POP

153

Answers: 150, 151, 152, 153

Trees are living things.

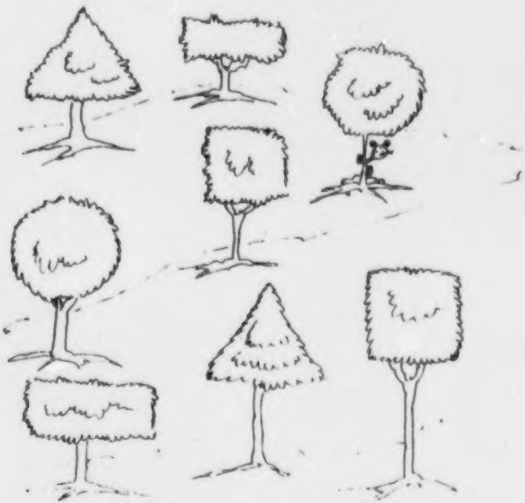
Directions:

Color the trees that look like a triangle △ green.

Color the trees that look like a circle ○ brown.

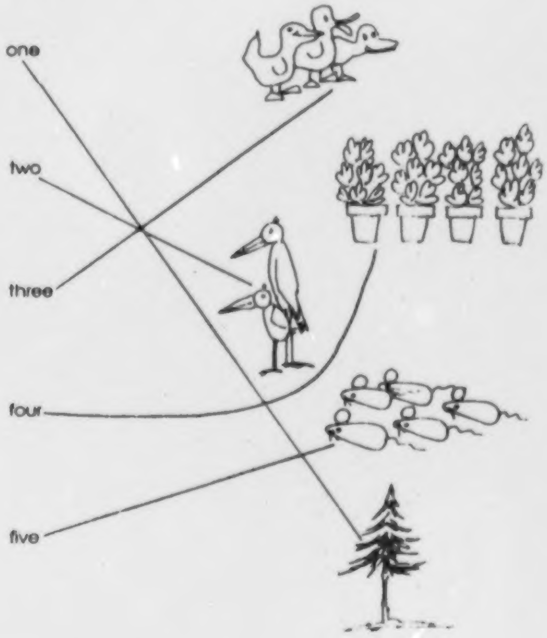
Color the trees that look like a rectangle ▭ yellow.

Color the trees that look like a square ☐ orange.



154

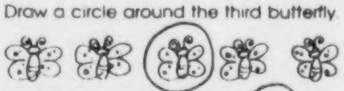
Directions:
Match the number words to the living things.



155

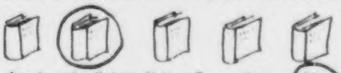
Follow the directions.

Draw a circle around the third butterfly.



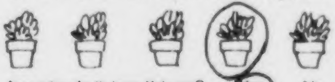
Is a butterfly a living thing? [✓ Yes] No

Draw a circle around the second book.



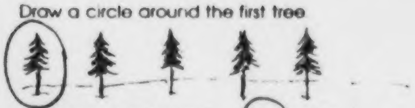
Are books living things? Yes [✓ No]

Draw a circle around the fourth plant.



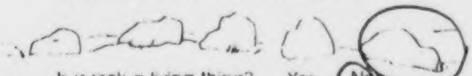
Are plants living things? [✓ Yes] No

Draw a circle around the first tree.



Is a tree a living thing? [✓ Yes] No

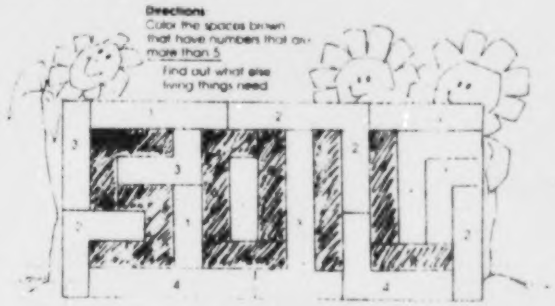
Draw a circle around the fifth rock.



Is a rock a living thing? Yes [✓ No]

156

All living things need air, water, and sun.
They need something else, too.



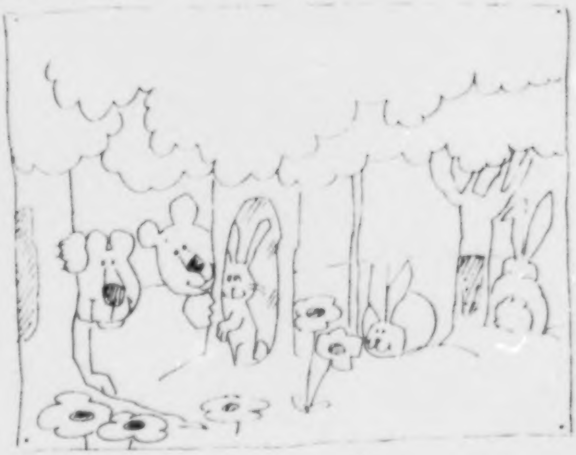
Directions
Color the spaces brown that have numbers that are more than 5.

Find out what else living things need.

157

Answers: 154, 155, 156, 157

Directions: Count. Write the numerals.

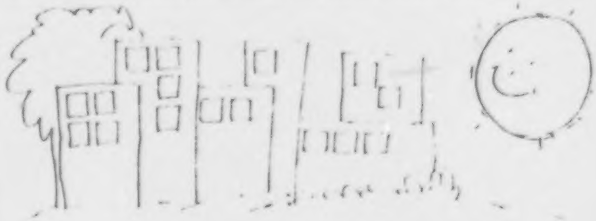


1. How many trees do you see? 4
2. How many bears can you see? 2
3. Are there more trees or more bears? trees
4. How many more? 2
5. How many rabbits can you see? 3
6. How many flowers can you see? 5
7. Are there more rabbits or more trees? trees
8. How many more? 1

158

Directions:
Do the problems. Watch the signs.

9 −5 4 E	3 +5 8 M	6 −1 5 V	5 +2 7 T
4 +2 6 I	9 −7 2 N	6 +3 9 O	8 −5 3 R



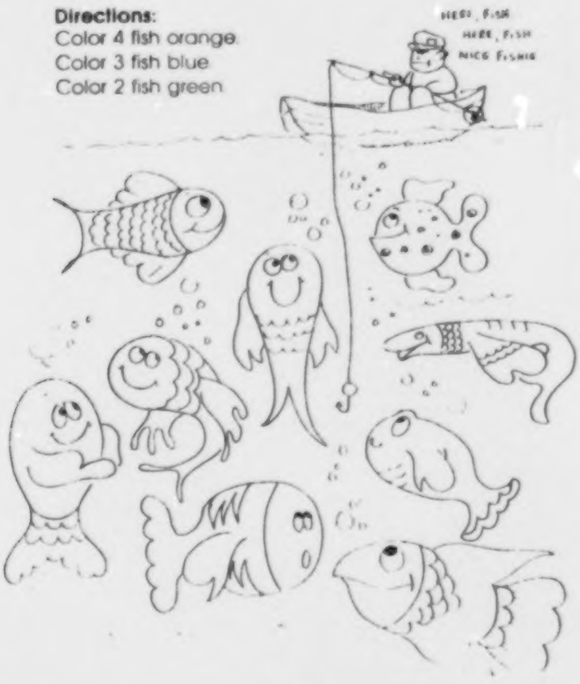
What is the big word that means EVERYTHING AROUND US?
Write the letters on the spaces that match your answers.

E N V I R O N M E N T

159

The environment for fish is water.

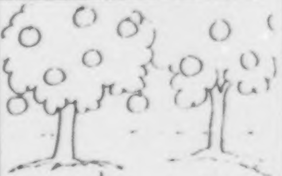
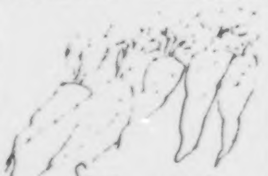
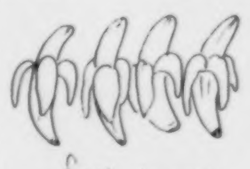
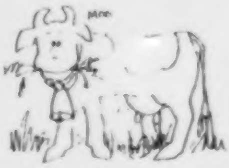
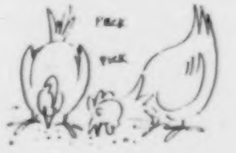
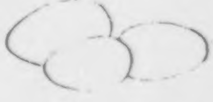
Directions:
Color 4 fish orange.
Color 3 fish blue.
Color 2 fish green.



160

Food comes from plants.

Directions:
Write the number words. one two three four five

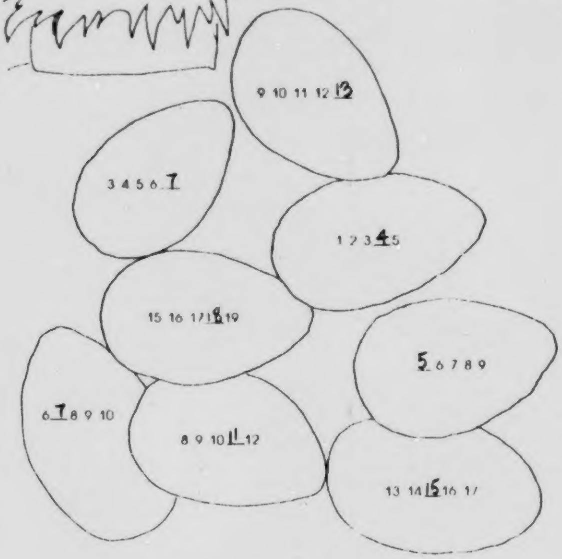
 two trees	 five carrots
 four bananas	 one cow
 two chickens	 three eggs

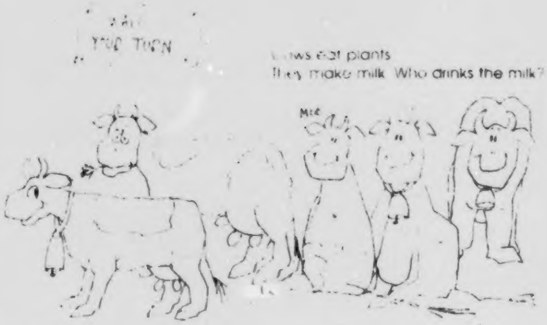
161

Answers: 158, 159, 160, 161

Chickens eat plants.
They make eggs.
Who eats the eggs?

Directions:
Write the missing number in each egg


9 10 11 12 13
3 4 5 6 7
1 2 3 4 5
15 16 17 18 19
5 6 7 8 9
6 7 8 9 10
8 9 10 11 12
13 14 15 16 17

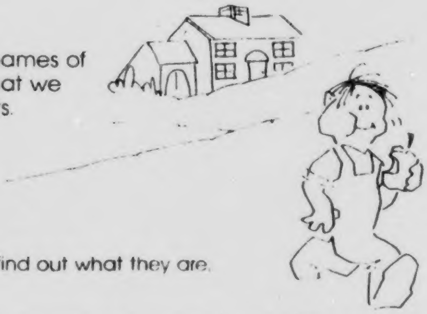

WAIT YOUR TURN

Cows eat plants.
They make milk. Who drinks the milk?

Directions

These cows are waiting to be milked.
Color the second cow brown.
Color the fourth cow black.
Color the third cow yellow.
Color the first cow black and white.
Color the fifth cow purple.

Here are the names of three things that we get from plants.



Directions:
Do the work to find out what they are.

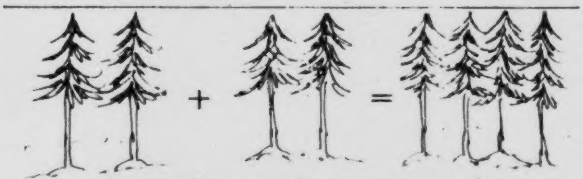
E 5 −4 1	O 7 −5 2	H 3 +4 7	S 8 −3 5	D 6 +4 10
F 3 +1 4	C 9 −6 3	L 5 +4 9	I 7 −1 6	U 5 +3 8

F	O	O	D		C	L	O	T	H	E	S
4	2	2	10		3	9	2	6	7	1	5

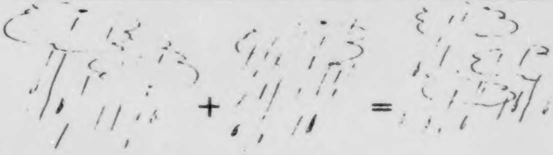
and	H	O	U	S	E	S
	7	2	8	5	1	5

These things can clean the air.

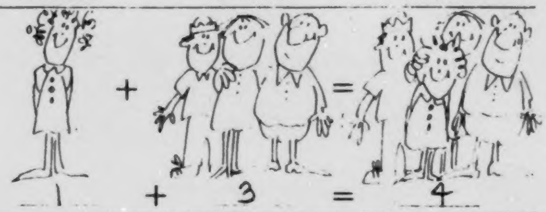
Directions:
Write the numbers. Add.



2 + 2 = 4

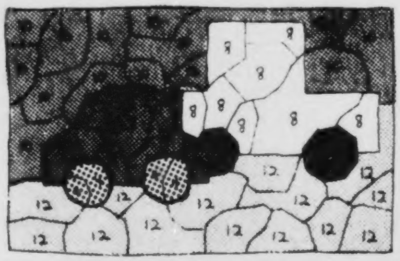


2 + 1 = 3



1 + 3 = 4

These can make the air dirty

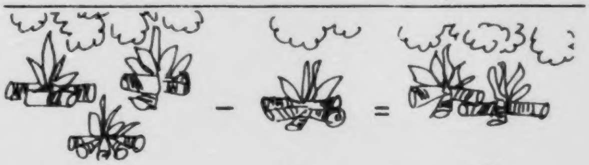


Directions:
Color the 2's yellow
Color the 4's brown
Color the 6's black
Color the 8's red
Color the 10's blue
Color the 12's green

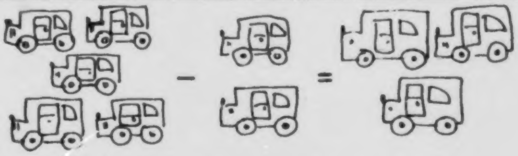
166

These things can cause air pollution.

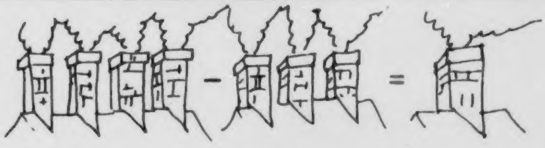
Directions: Write the numbers. Subtract.



3 – 1 = 2

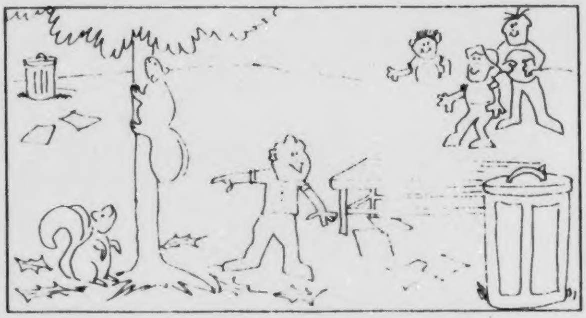


5 – 2 = 3



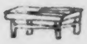
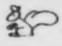
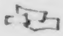
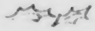
4 – 3 = 1

167



There is lots of litter in the park. Use the picture to answer the questions.

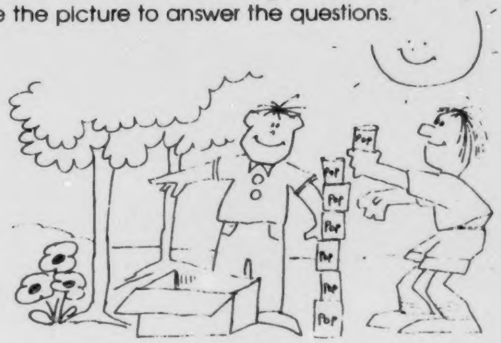
Directions: Circle the right answer.

How many do you see? 3 [✓ 2] 5
How many  do you see? [✓ 1] 4 2
How many do you see? 7 [✓ 4] 5
How many  do you see? 3 [✓ 2] 1
How many  are on the ground? 4 [✓ 6] 2
How many  are on the ground? [✓ 5] 1 3

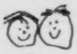
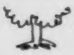
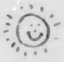
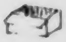
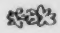
Where is a good place to put the litter? Color them red

168

Jennifer and Mark are saving cans for recycling. Use the picture to answer the questions.



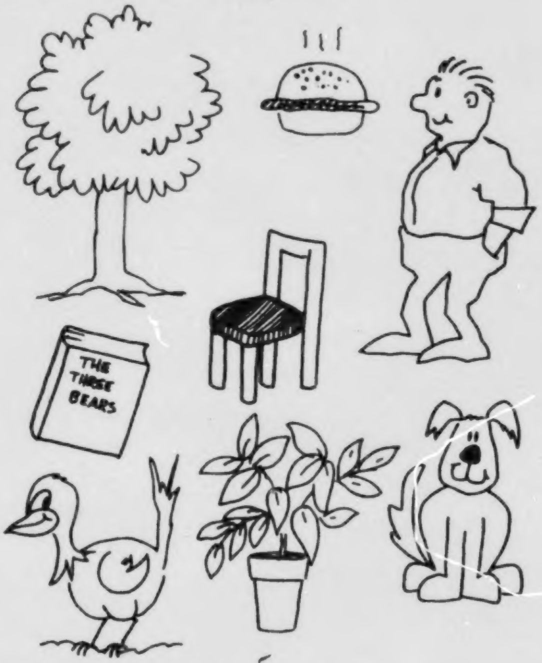
Directions: Circle the correct numeral.

How many  do you see? [✓ 2] 3 5
How many do you see? 4 6 [✓ 7]
How many  do you see? 3 [✓ 2] 1
How many  do you see? 5 [✓ 1] 2
How many  do you see? [✓ 1] 3 7
How many  do you see? 5 6 [✓ 3]

169

Answers: 166, 167, 168, 169

Directions:
Color the things that are living.

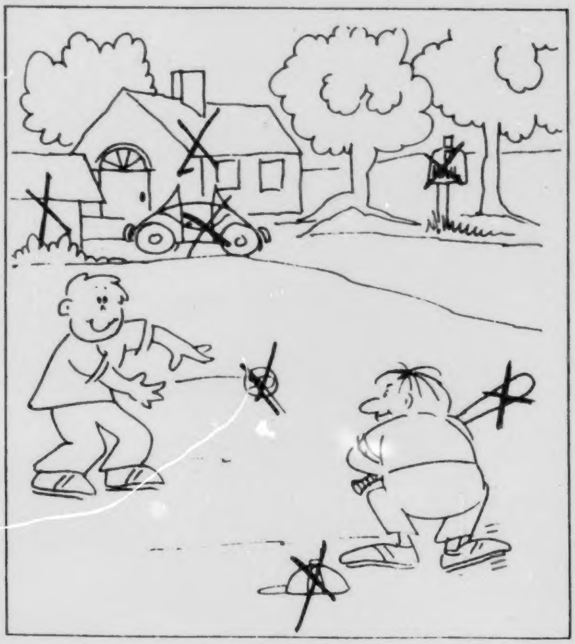


How many do you see? 5

170

Animals and plants are living things.

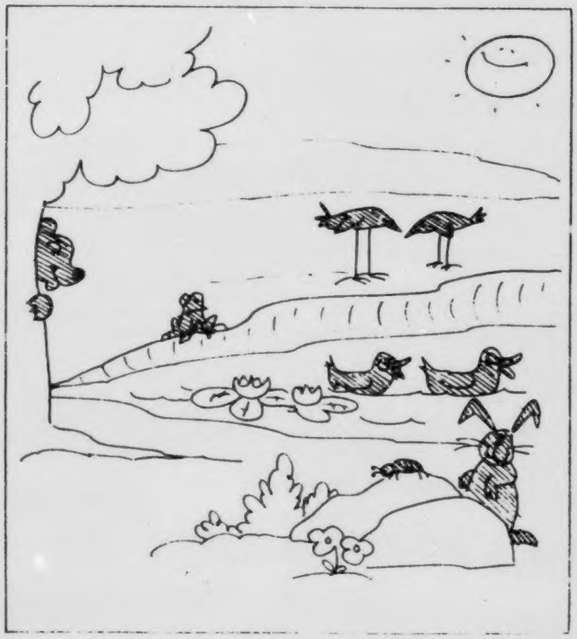
Directions:
Color all the things that are alive. Put an X on the things that are not alive.



171

Animals can move around. Plants can not.
Some animals can run and jump.
Some can swim or fly.

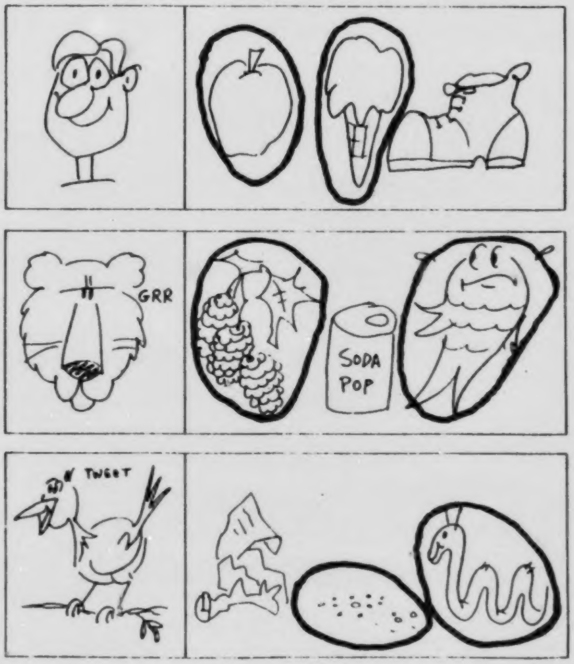
Directions: Color the animals.



172

Animals need food to grow.

Directions:
Draw a circle around the things each animal can eat.



173

Answers: 170, 171, 172, 173

All animals need plants to live. Plants give us air to breathe. They give us many other things, too.

Directions:
Draw a picture in each box to show other things we get from plants.

We get food from plants.

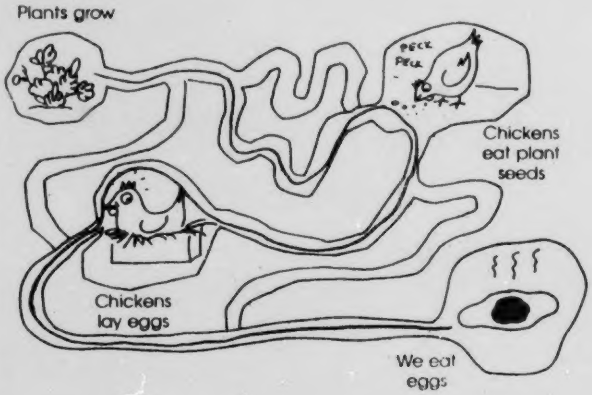
Plants give us houses to live in.

Plants make our land pretty.

We get clothes from plants.

All our food comes from plants. Even the eggs, milk, and meat we eat starts first with plants.

Directions:
Follow the right path to see how plants turn into eggs.

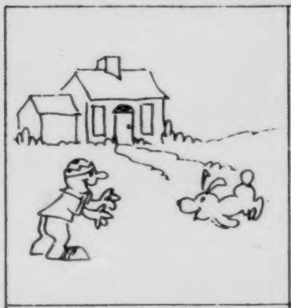


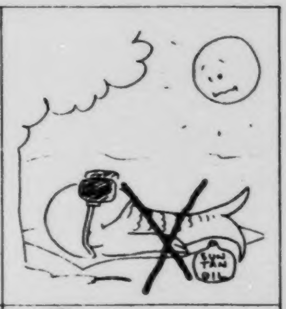
Write what happens:

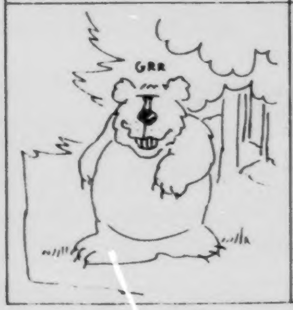
1. Plants grow.
2. Chickens eat plant seeds.
3. Chickens lay eggs.
4. We eat eggs.

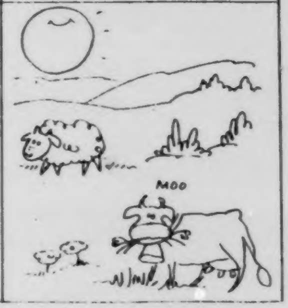
The environment is everything around us. It is all the things we need to live.

Directions:
Color the pictures that show animals in the right environment. Put an X on the picture that is wrong.





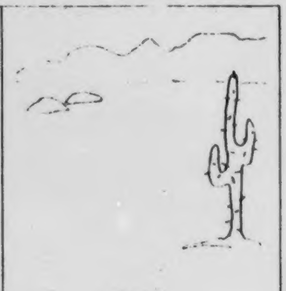




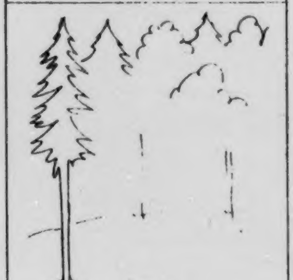
Every animal has a special place in its environment where it lives best. This is its habitat.

Directions:
Draw an animal that lives in each of the habitats below.

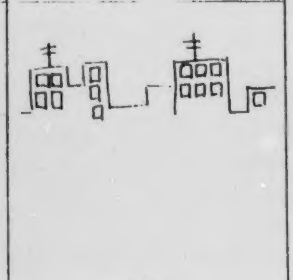
ocean



desert



forest

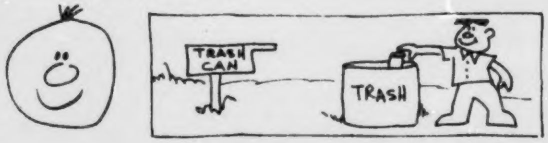


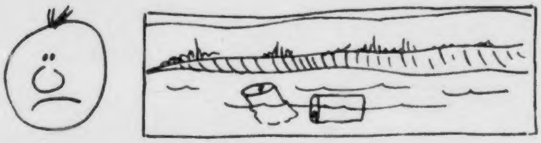
city

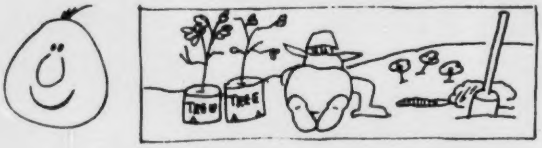
Answers: 174, 175, 176, 177

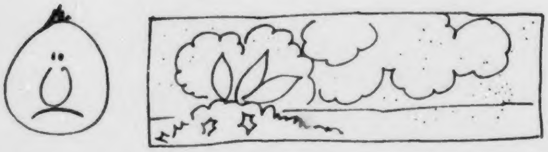
Here are some things we can do for our environment.

Directions:
Draw a smile if this picture will help. Draw a frown if this picture is bad for our environment.


TRASH CAN
TRASH

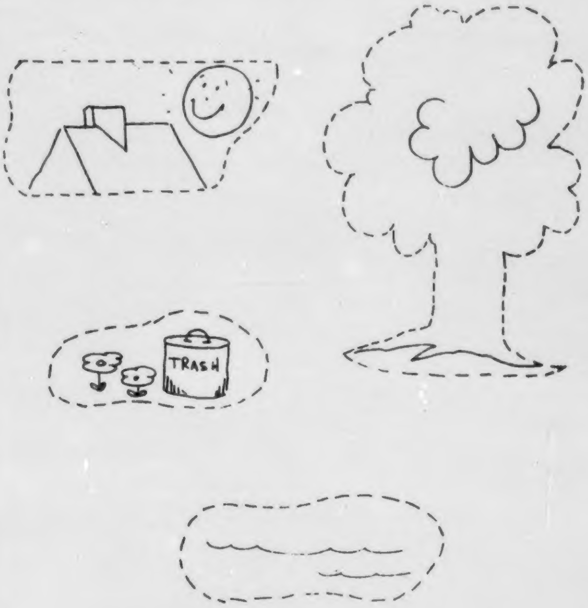


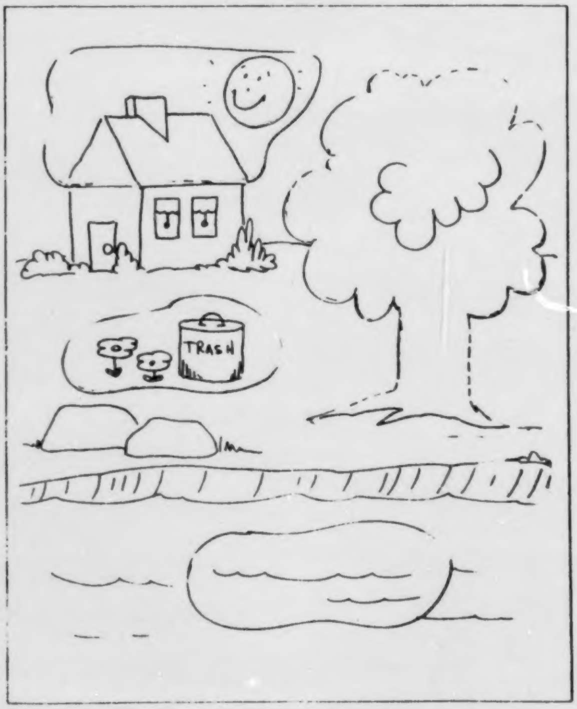




We need clean air to breathe.
We need clean water to drink.
We need to keep our land clean, too.

Directions:
Cut out these shapes on the dotted lines. Paste them on the picture to clean up the environment.

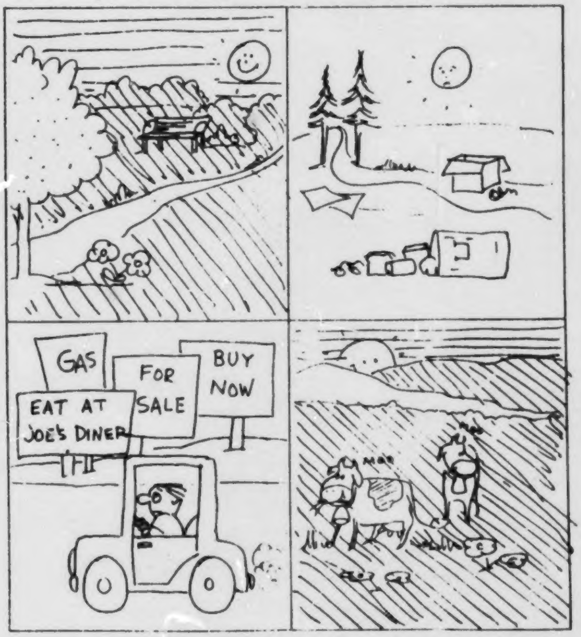




We all need help to keep our environment clean.

Sometimes people pollute the land. Polluted land does not look very nice.

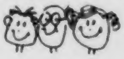
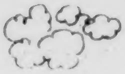
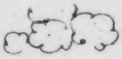
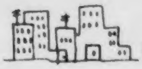
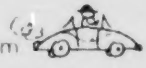
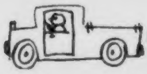
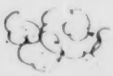
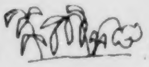
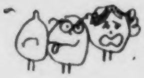
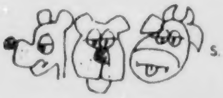
Directions:
Color the pictures that show land that is not polluted.


GAS
FOR SALE
BUY NOW
EAT AT JOE'S DINER

Answers: 178, 179, 180, 181

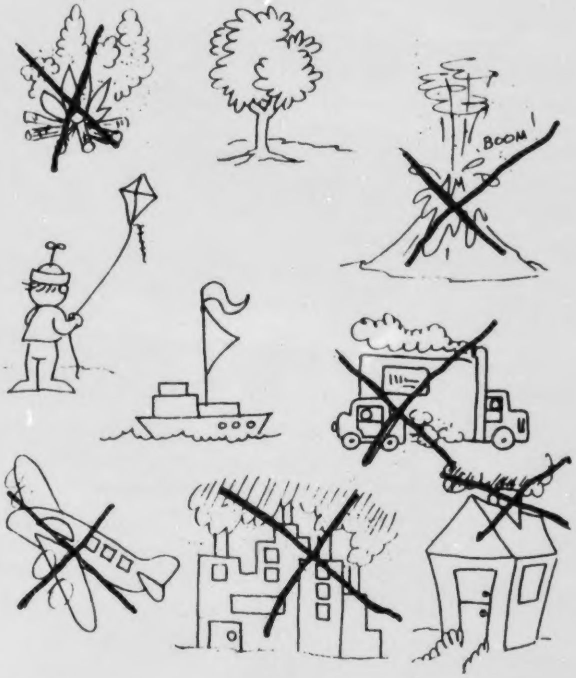
How does air get polluted?

Directions:
Use the pictures to read the story

When  burn things,  gets in the air.  comes from many of our s. Smoke comes from s and s also.  makes the air dirty or polluted. Dirty air is bad for , , and other s.

Circle the right answers.

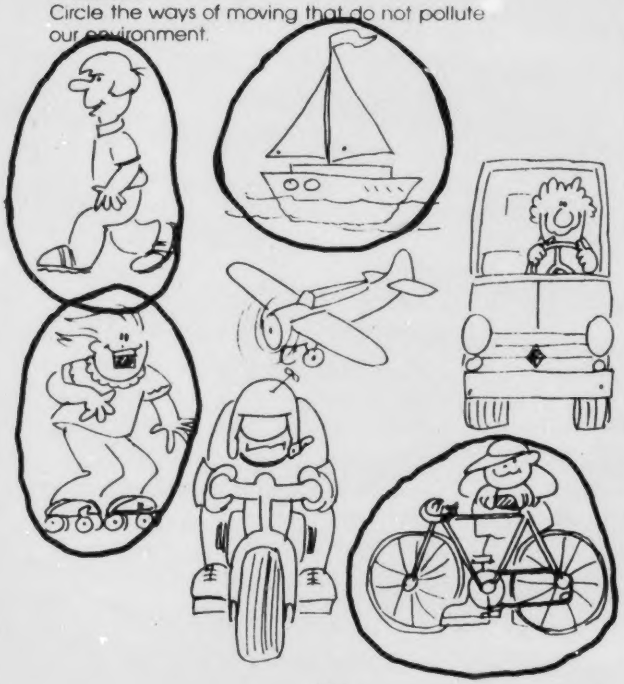
Is polluted air dirty? [✓ Yes] No
Does smoke make the air polluted? [✓ Yes] No
Is polluted air good for plants? Yes [✓ No]
Is polluted air good for animals? Yes [✓ No]



Put an X on the things that cause air pollution.

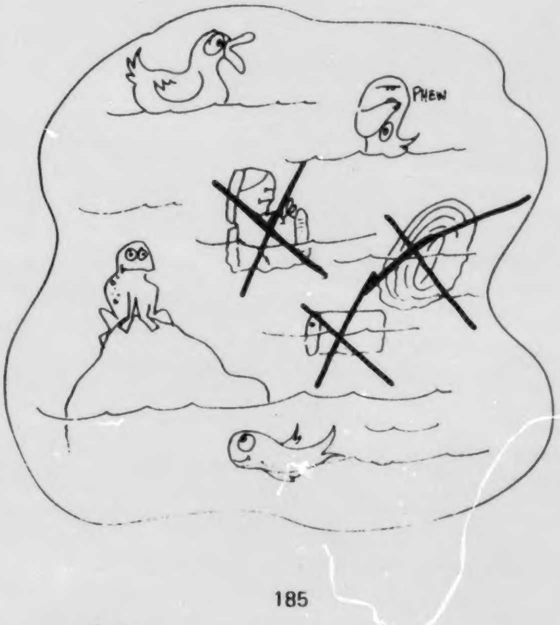
The way we get to places can help or hurt our environment.

Directions:
Circle the ways of moving that do not pollute our environment.



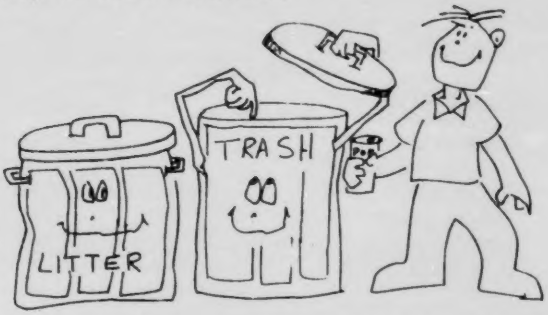
Trash and litter do not belong in the water. They make the water polluted. Polluted water looks bad, smells funny, and can make you sick.

Directions:
Put an X on the things that do not belong in the water.



Answers: 182, 183, 184, 185

Here are some ways we can keep our environment clean.



Draw a line under two things that will help keep our land clean.

1. Pick up litter.
2. Wash the rocks.
3. Use a trash can.

Draw a line under two things that will help keep our air clean.

1. Don't burn trash.
2. Walk, instead of riding in a car.
3. Paint the sky blue.

Draw a line under two things that will help keep our water clean.

1. Drink soda pop.
2. Don't throw bottles or cans in rivers.
3. Don't put trash in lakes.

Read the story.

Much of our water is dirty or polluted. Some dirt comes from homes and factories. People throw trash in and near water. Oil and trash from ships make water dirty, too.

Plants and animals need clean water to live.

Directions: Choose the correct word to complete each sentence.

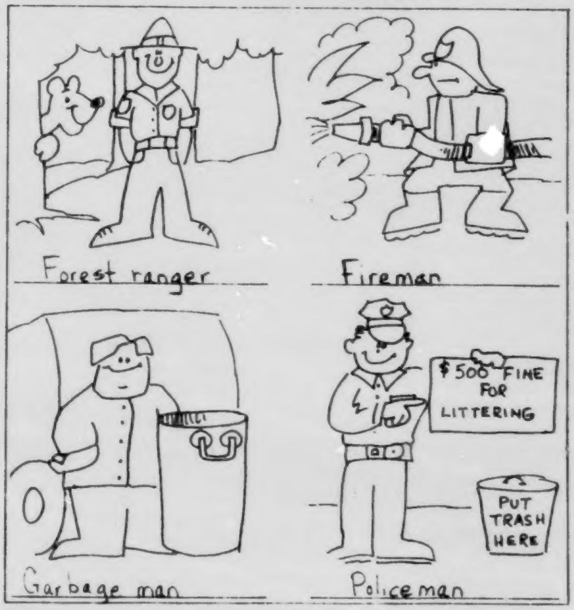
ships trash factories animals

1. Oil from ships can make the water dirty.
2. Much dirt comes from factories.
3. We should not throw trash in or near water.
4. Plants and animals need clean water to live.

Many people work to keep our environment clean.

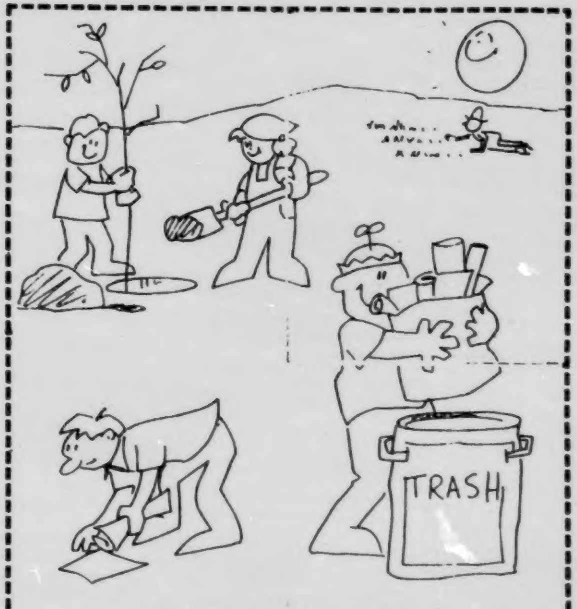
Directions:
Write the name for each person under his picture.

Forest ranger
Fireman
Garbage man
Policeman



Forest ranger
Fireman
Garbage man
Policeman

Directions: Cut out the pieces on the dotted lines. Put the puzzle together. Color it.



We all need to work together to keep our environment clean, healthy, and beautiful.

Answers: 186, 187, 188, 189

CONSERVATION FOR CHILDREN

Criterion Referenced Test (1)

Name ________________________________

Date ________________________________
Pre Post

Pre	Post		
____	____	1.	Is a tree a living thing? *(YES)*
____	____	2.	How are plants and animals different? *(Animals can talk, move, read a book, etc.)*
____	____	3.	What do all plants and animals need to live? *(AIR, SUN, WATER, SOIL)*
____	____	4.	How do animals help us? *(Provide food, clothes, transportation, pets, etc.)*
____	____	5.	How do plants help us? *(Provide food, clothes, clean air, shade, wood, look pretty, etc.)*
____	____	6.	What does all our food come from? *(PLANTS)*
____	____	7.	What does "environment" mean? *(Our surroundings, everything around us)*

Pre Post

____ ____ 8. What is a "habitat"?

(Special home of an animal or plant; place where they live best)

____ ____ 9. Tell me one cause of air pollution. Water pollution. Land pollution.

Air - (cars, smoking, factories, airplanes, exhaust)

Water - (oil, trash, garbage, sewage)

Land - (litter, billboards, junk cars, etc.)

____ ____ 10. Tell me one way we can keep the air clean. Keep the water clean. Keep the land clean.

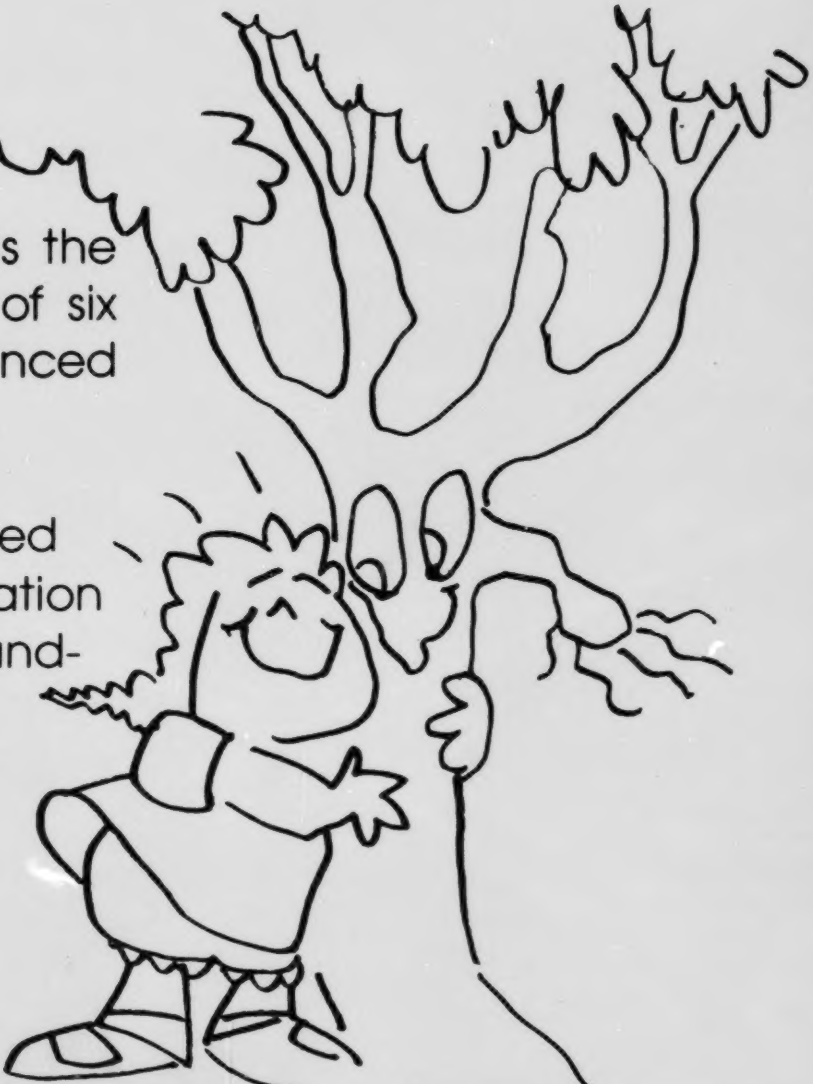
Air - (don't smoke, walk rather than ride in cars when possible, ride a bike, enforce laws for filters, don't burn, etc.

Water - (don't throw litter in water, sewage treatment, avoid oil spills, etc.)

Land - (put litter in proper place, reduce amount of garbage, recycle as much as possible, etc.)

Level 2

Conservation For Children



This activity guide is the second in a series of six grade level sequenced guides.

It has been developed to promote conservation awareness, understanding and action for elementary school children.

An ESEA Title IV-C Project

Validated by the Joint Dissemination Review Panel,
U.S. Department of Education

Produced by Cupertino Union School District
John Muir Elementary School
6560 Hanover Drive
San Jose, California 95129
(408) 725-8376 - Program Office
(408) 252-5265 - School

Board of Education

Roger C. Halstead, President
Joan Barram
Robert D. Hall
Valerie Harrison
Pat McKinley

PROJECT STAFF

State Consultant: William A. Johnson

Associate Superintendent: William Zachmeier

Project Administrator, Principal: Rex Wetzel

Director: Marilyn Bodourian

Program Clerks: Carole Kumaishi
Alice Ruick

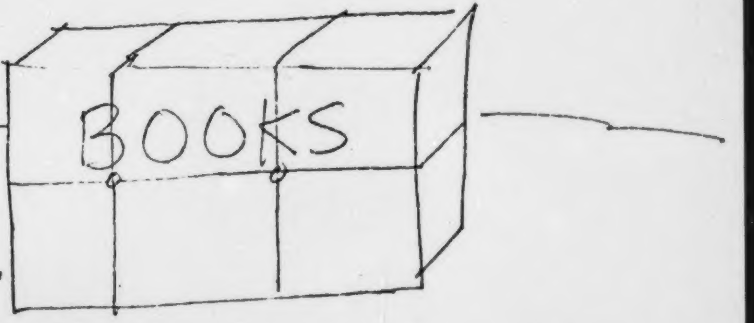
Illustrator: Gen McKenzie

Evaluators: Lynn Fossum
Eloise Martin Appel

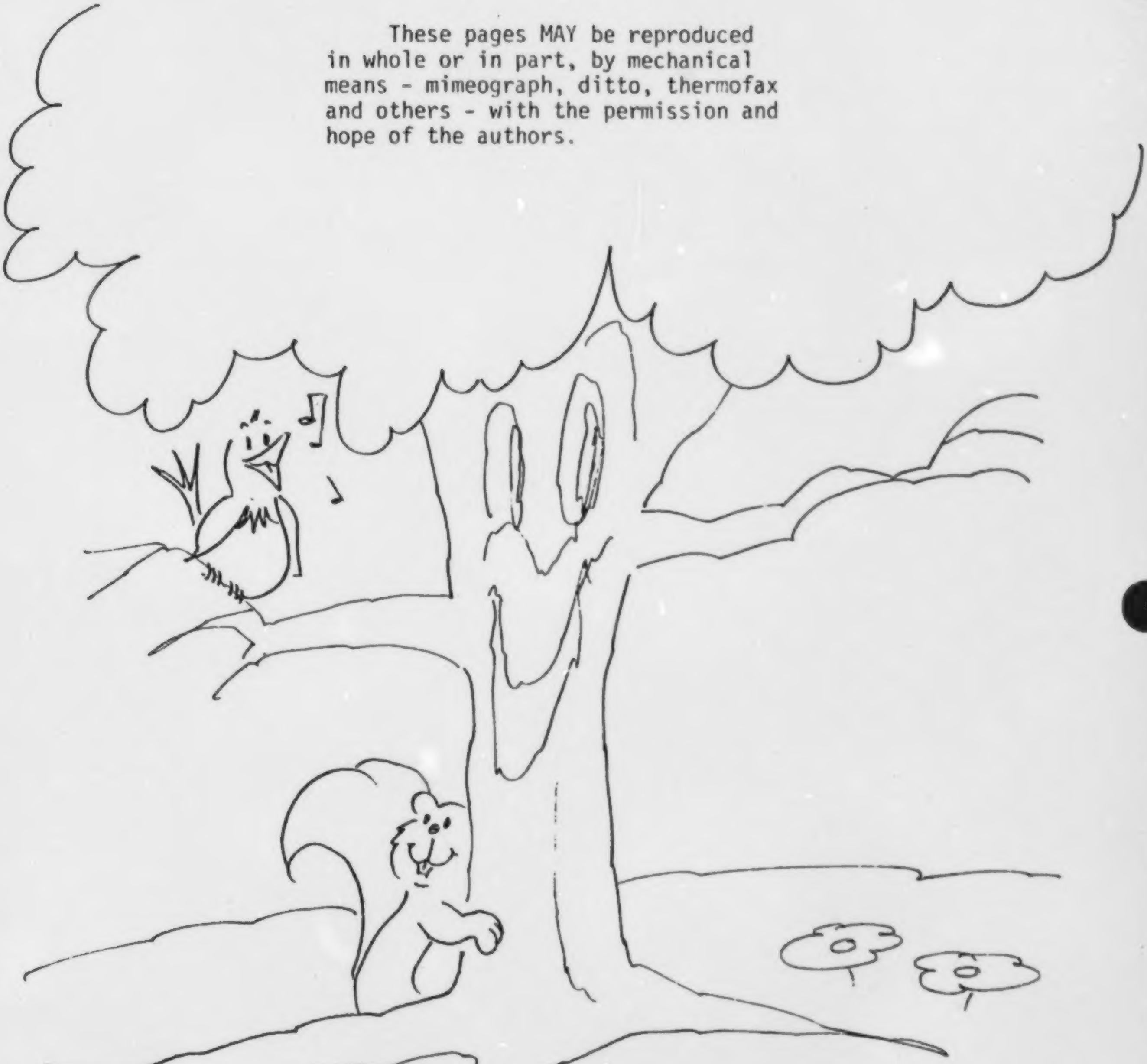
Consultants: Environmental Volunteers
Jane Hall

Special thanks to the following project teachers and their students who were willing to participate in the development, field testing, and evaluation of the materials. This project would not have been possible without their valuable assistance.

Gail Vinall
Janice Higgins
Stacey Pulsipher
Carol Peterson
Cecilia Fraass
Mary Stradinger



These pages MAY be reproduced in whole or in part, by mechanical means - mimeograph, ditto, thermofax and others - with the permission and hope of the authors.



The pages in this book are printed on 100% recycled paper.

TABLE OF CONTENTS

PART 1

Introduction

Purpose, contents, how to use the materials 200

Conservation Concepts .202

Criterion Referenced Test 203

Test-Worksheet Correlation 205

Content Guide 206

PART 2

Student Worksheets

Language Arts 210

Mathematics 250

Social Studies, Science 270

Related Activities .290

APPENDIX

Answers
   Student Worksheets
   Criterion Referenced Test

INTRODUCTION

PURPOSE:

The CONSERVATION FOR CHILDREN materials were developed to enable teachers to provide relevant conservation information for students in an easy and practical manner.

As our natural resources decline, both in quality and quantity, the importance of conservation education cannot be understated. As children become aware of environmental problems, they can better understand the precedents and consequences of such and their interdependency with the environment. This knowledge will hopefully lead to positive action.

CONTENTS:

Each grade level guide includes:

1. Conservation Concepts -

   These grade level concepts have been determined by teachers to meet the basic interests of students and to correlate with other grade level subject matter.

2. Criterion Referenced Test -

   A student test designed to measure pre and post knowledge of the grade level conservation concepts.

3. Class Record Sheet -

   A recording sheet for teacher use in programming instruction. This page also correlates the test items and student worksheets.

4. Content Guide -

   The guide correlates accepted basic skill objectives and conservation topics. The listing of student worksheets includes

forty pages of language arts activities, twenty pages of mathematics, twenty pages of social studies and science, and ten pages of related activities.

5. Student Worksheets -

   Ninety worksheets which integrate basic skills objectives and conservation information. The worksheet pages were planned and developed by students and teachers and are intended for duplication. They are readily usable in the classroom and require no additional materials, time or space. These worksheets were designed to be relevant, motivating and fun for children.

USING THE MATERIALS:

The CONSERVATION FOR CHILDREN materials may be used as a primary resource for teaching basic skills, as supplementary materials to a core program, as enrichment activities, skill review, or as a unit of study.

The worksheets have purposefully not been sequenced or arranged in any order, other than subject area, to encourage teachers to pick and choose those that will meet the needs of their students. Teachers may use the Content Guide to identify basic skills and/or conservation topics for each worksheet. Conservation concepts are covered in each basic skill area and are presented in several worksheets with varying degrees of difficulty. Each worksheet is independent of the others.

The criterion referenced test is included for teachers who want to assess student growth in conservation knowledge. Recording pretest results on the class record sheet will enable teachers to program the materials to meet individual and group needs.

LEVEL 2 - CONCEPTS

CHILDREN WILL LEARN

- Characteristics of plant and animal habitats.
- Interdependency of plants and animals.
- Elements of a basic food chain.
- Identification of natural resources from which common articles are made.
- At least two causes of air, water and earth pollution.
- At least two methods of conserving air, water and soil.
- The meaning of:
    - Conservation
    - Habitat
    - Natural resource
    - Pollution
    - Recycle

CONSERVATION FOR CHILDREN

Criterion Referenced Test (2)

NAME ______________________________

DATE ______________________________

DIRECTIONS: Read the questions.
Write your answers on the blank spaces.

1. Write the name of a plant or animal that lives in each of these habitats.

The Ocean ________________________ The Forest ________________________

The Desert ________________________ The Pond ________________________

The City ________________________

2. What do all food chains begin with? ________________________

3. Name something animals do for plants.

____

____

4. Name something plants do for animals.

____

____

5. What does recycle mean?

____

____

6. Write the names of five natural resources.

   1. ____________________
   2. ____________________
   3. ____________________
   4. ____________________
   5. ____________________

7. What is paper made from? ____________________

8. What is glass made from? ____________________

9. What is plastic made from? ____________________

10. Write the names of two things that cause air pollution.

    ____

    ____

11. Write the names of two things that make the water polluted.

    ____

    ____

12. Write two things you can do to make our environment cleaner.

    ____

    ____

CONSERVATION FOR CHILDREN

Class Record Sheet
Criterion Referenced Test - Grade 2

Question #	No. right on Pre-test	No. right on Post-test	Student Worksheets
1. Write the name of a plant or animal that lives in each of these habitats.			210, 211, 218, 219 220, 221, 222, 253 254, 257, 258, 261 279
2. What do all food chains begin with?			215, 256, 259, 274
3. Name something animals do for plants.			269, 275, 277
4. Name something plants do for animals.			213, 214, 216, 227 228, 229, 230, 250 268, 271, 273
5. What does 'recycle' mean?			266, 267, 282, 283 288, 289
6. Write the names of five natural resources.			224, 225, 229, 230 237, 239, 240, 260 277, 278, 281, 284 285
7. What is paper made from?			226, 230, 231, 263 285
8. What is glass made from?			230, 231, 263, 285
9. What is plastic made from?			230, 231, 263, 285
10. Write the names of two things that cause air pollution.			231, 243, 244, 246 249, 265, 287
11. Write the names of two things that make the water polluted.			241, 242, 249, 287
12. Write two things you can do to make our environment cleaner.			232, 233, 234, 238 244, 246, 247, 248 249, 251, 255, 262 280, 284, 288, 289

Page No.	Skill	Conservation Topic	District Curriculum
Language Arts			
210	Literal comprehension	Environments	
211	Literal comprehension	Environments	
212	Homonyms	Vocabulary	
213	Literal comprehension	Plants and animals	
214	Singular, plural nouns	Interdependency	
215	Interpretive comprehension	Food chains	
216	Literal comprehension	Food chains	
217	Punctuation	Birds	
218	Categorizing	Habitats	
219	Singular, plural nouns	Habitats	
220	Acrostic	Habitats	
221	Rhyming words	General	
222	Directions, right, left	Habitats	
223	Alphabetical order	Vocabulary	
224	Literal comprehension	Natural resources	
225	Literal comprehension	Natural resources	
226	Literal comprehension	Glass	
227	Classification	Natural source of products	
228	Vowel sounds	Grass	
229	Word definitions	Trees	
230	Spelling, mis-	Natural resources	
231	Beginning consonants	Sources of products	
232	Interpretive comprehension	Conservation of resources	

Page No.	Skill	Conservation Topic	District Curriculum
233	Compound words	Litter	
234	Alphabet, sequence	Litter	
235	Cursive writing	Vocabulary	
236	Spelling, mis-	Vocabulary	
237	Alphabet, before, after	Sun	
238	Contractions	Litter	
239	Following directions	Water conservation	
240	Sentences, complete, inc.	Water	
241	Verb tense, ed, ing, s	Water pollution	
242	Prepositions	Water pollution	
243	Spelling	Air pollution	
244	Sequencing	Pollution solutions	
245	Word find	Vocabulary	
246	Sentence completion	Conservation methods	
247	Interpretive comprehension	Conservation methods	
248	Sequencing	Litter	
249	Literal comprehension	Air pollution	
Math			
250	Counting by 2's	Natural products	
251	Addition, subtraction, -18	Conservation methods	
252	Number sentences, -18	Food chains	
253	Addition, single digits	Habitats	
254	Addition, subtraction, -10	Habitats	
255	Addition, 2 digits, carrying	Conservation methods	

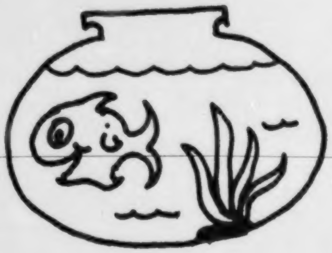
Page No.	Skill	Conservation Topic	District Curriculum
256	Word problems, subtraction	Food chains	
257	Ordinal numbers	Habitats	
258	Ordinal numbers	Habitats	
259	Addition, 3 column	Food chains	
260	Number sequence, 1-60	Natural resources	
261	Sequence, before, after	Habitats	
262	Addition, -18	Litter	
263	Number sentences, addition	Natural sources	
264	Place value	Water conservation	
265	Counting by 5's	Air pollution	
266	Calendar reading	Recycling	
267	Even numerals	Recycling	
268	Word problems	Tree products	
269	Multiplying, 1 digit	Interdependency, plants, animals	
Social Studies/Science			
270	Identification	Plant parts	
271	Interpretive comprehension	Plants, food for animals	
272	Interpretive comprehension	Animals, predators	
273	Classification	Food, plants and animals	
274	Sequencing	Food chains	
275	Literal comprehension	Interdependency	
276	" " (2 pages)	"	
277	Sequencing	Soil	
278	Interpretive comprehension	Soil, plants	

Page No.	Skill	Conservation Topic	District Curriculum
279	Decoding	Habitats	
280	Interpretive comprehension	Environmental changes, man	
281	Matching	Natural sources	
282	Interpretive comprehension	Recycling	
283	Rebus	Recycling	
284	Interpretive comprehension	Conservation methods	
285	Classification	Natural resources	
286	Interpretive solutions	Conservation methods	
287	Sequencing	Pollution causes	
288	Interpretive comprehension	Conservation methods	
289	Puzzle	Recycling	
Related Activities			
290	Introduction		
291	Arts and Crafts	Pine cone feeders	
292	Arts and Crafts	Ceramic leaves	
293	Arts and Crafts	Garden Hats, laminated paper	
294	Growing Plants	Plastic bag gardens	
295	Growing Plants	Sponge gardens	
296	Music	"Help Woodsy Spread the Word.."	
297	Music	"The Ballad of Woodsy Owl"	
298	Send Aways	Conservation materials	
299	Student Bibliography	Conservation books, fact and fiction	

Name

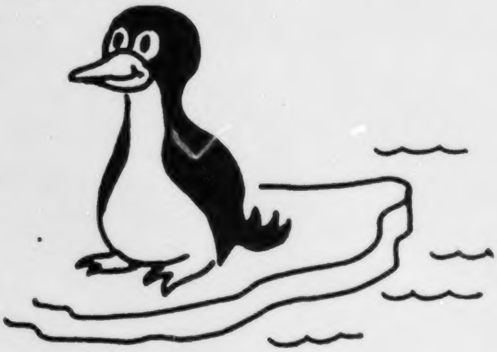
Environment is what is around every living thing. Environment is what every living thing needs for life.

Here is a fish. Water is his environment.



You could not live under the earth, but this worm likes it there. It is his environment.

This penguin lives at the south pole. He likes his environment cold.

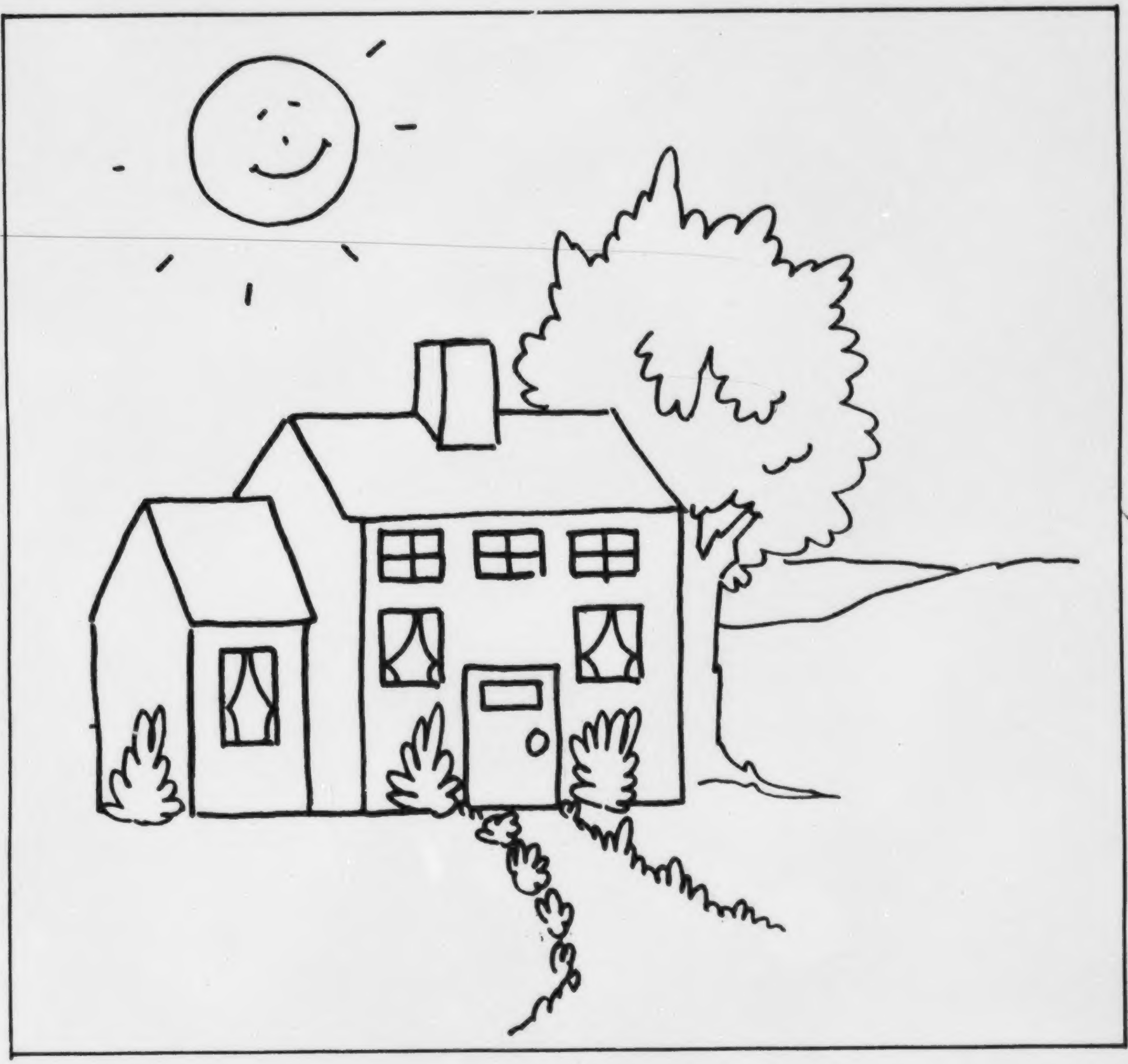


This lizard and cactus live in a desert. They like their environment hot and dry.

Name

This is your environment.

Draw yourself in the picture.

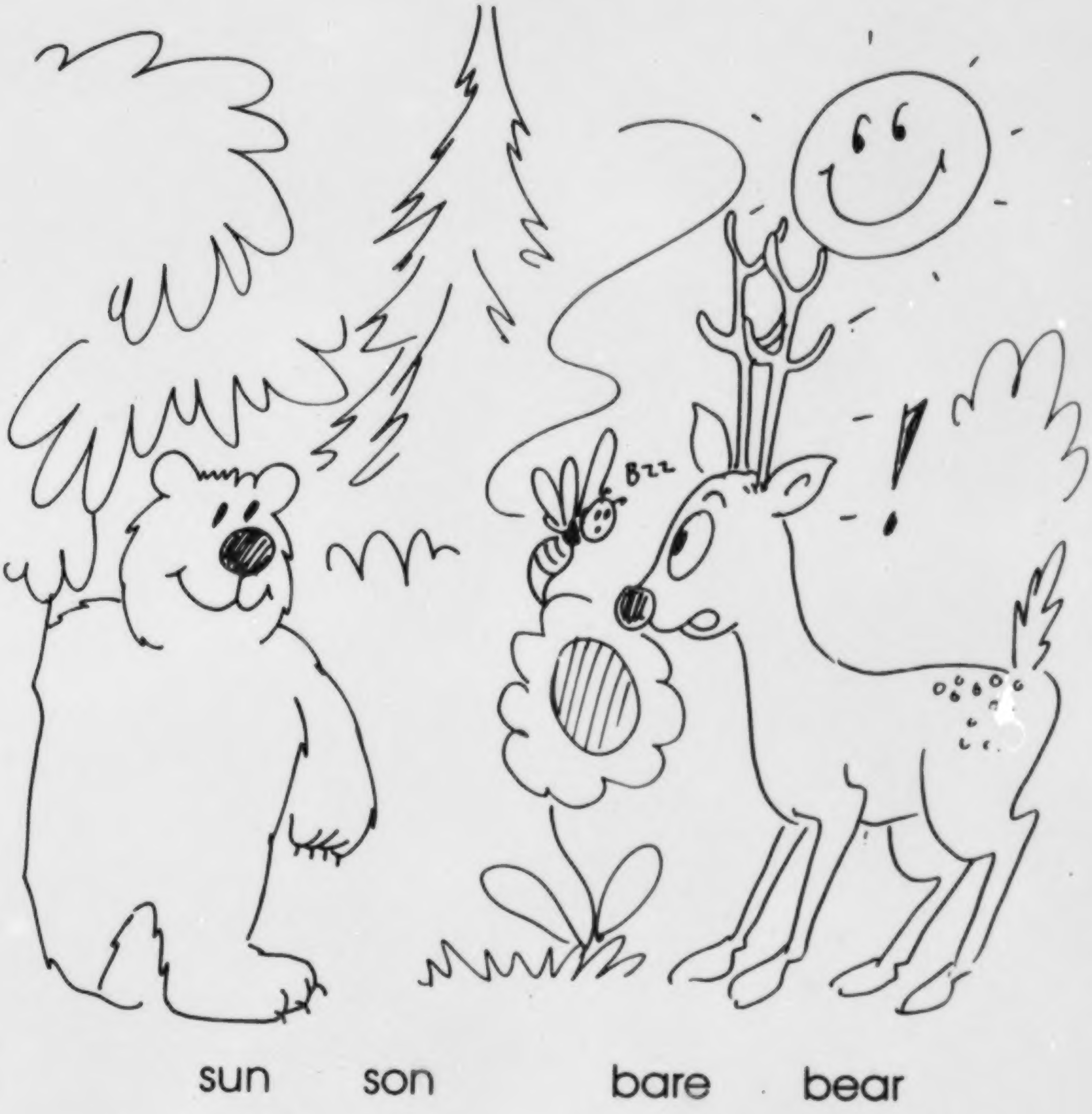


Write the word that means what is around every living thing.

148

Name

Homonyms are words that sound alike but are spelled differently. Circle the words that you see in the picture.



sun son bare bear

flower flour dear deer

bee be

Name ______________________________

Directions: There is an extra word in each of these sentences. *Cross out the word that is not needed and* write it on the line below.

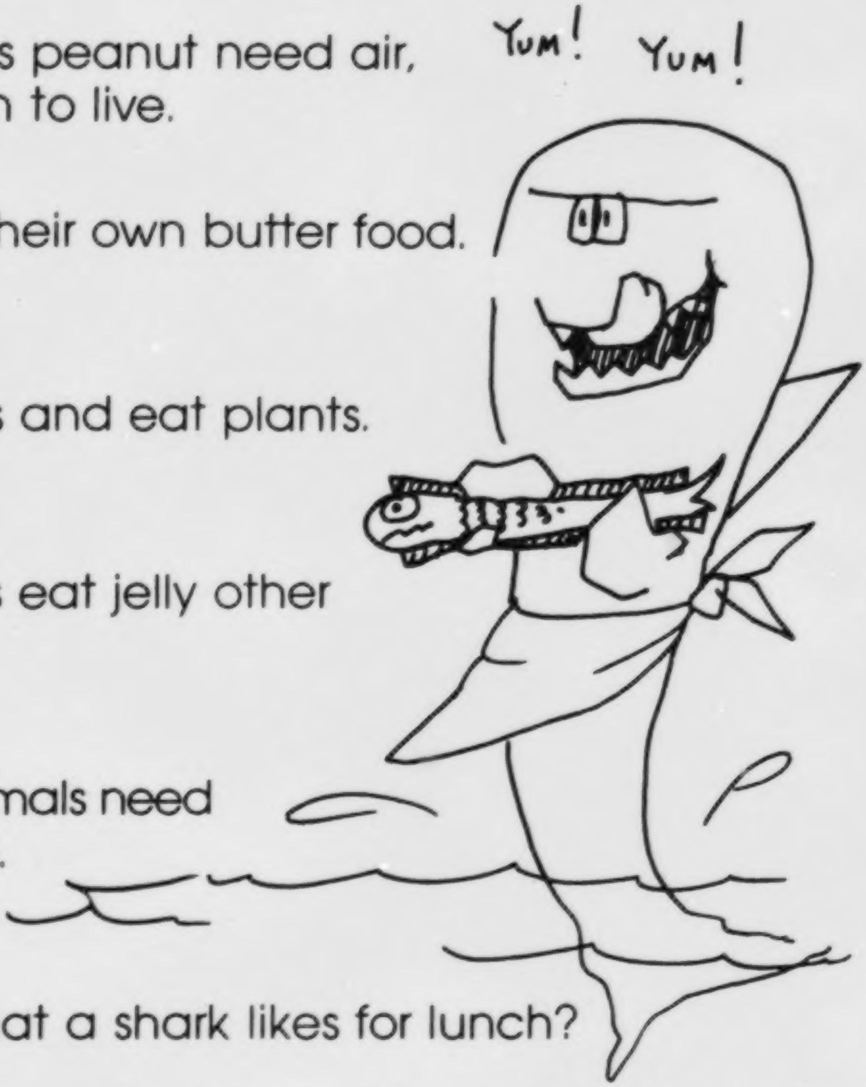
1. All living things peanut need air, water, and sun to live.

2. Plants make their own butter food.

3. Some animals and eat plants.

4. Some animals eat jelly other animals.

5. Plants and animals need food to fish live.



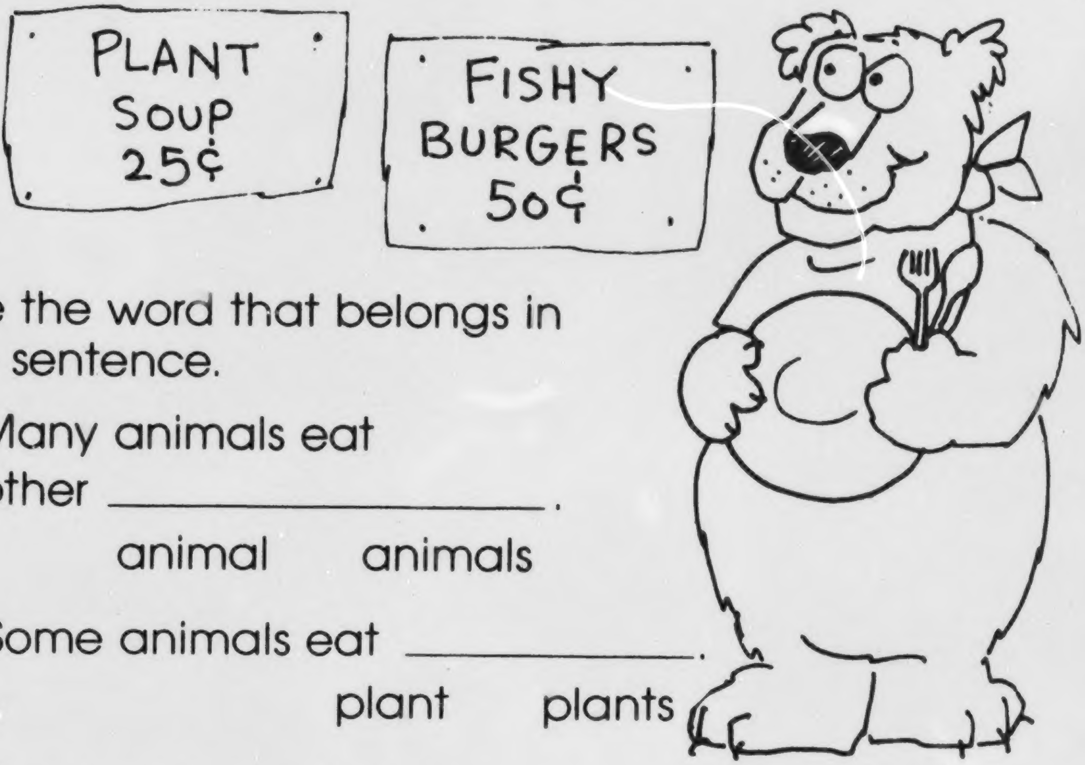
Do you know what a shark likes for lunch?

Write each word you crossed out in the blanks.

1.________________ 2.________________ 3.________________

4.________________ 5.________________!

Name ______________________________

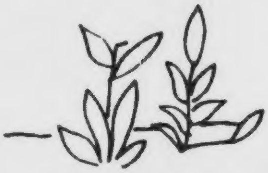
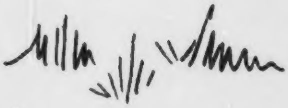
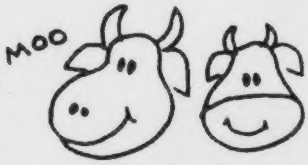
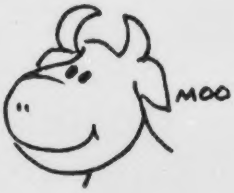
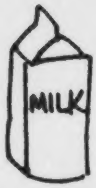
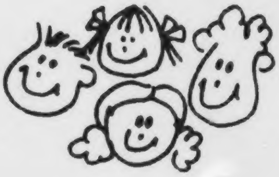
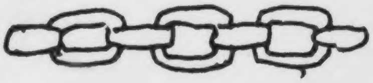


Circle the word that belongs in each sentence.

1. Many animals eat other ______________.
   animal   animals
2. Some animals eat ______________.
   plant   plants
3. This is part of nature's ______________ chain.
   food   foods
4. Fish eat small water ____ and other smaller fish.
   plant   plants
5. Some ______________ can catch fish to eat.
   bear   bears
6. Owls and eagles can catch small animals like _.
   rabbit   rabbits
7. ______________ eat many plants and animals.
   People   Peoples
8. All plants and animals need each _____ to live.
   other   others

Name

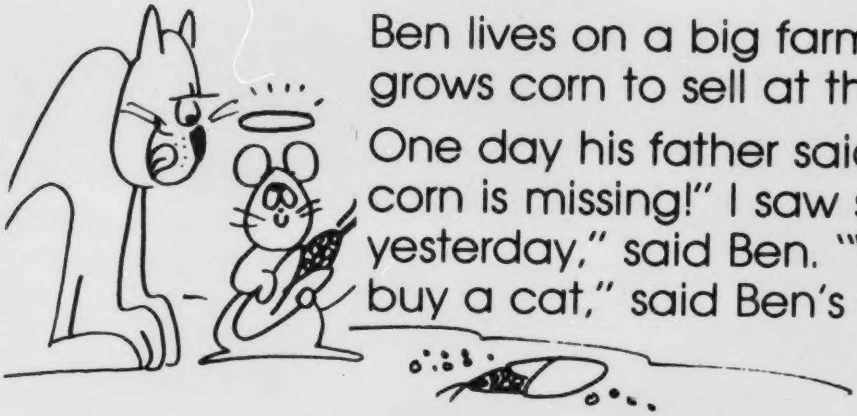
Directions: Use the pictures to read the story about food chains.

All food chains start with  .  is eaten by  . The  makes  .  drink the milk. This is a food  .

Use these words to fill in the missing part: bees carrots

	rabbit	fox	
flowers		honey	bear

Name



Ben lives on a big farm. His father grows corn to sell at the market.

One day his father said "some of our corn is missing!" I saw some big mice yesterday," said Ben. "We will have to buy a cat," said Ben's father.

Write a sentence to answer the questions.

1. Who lives on a farm?

2. What does Ben's father grow?

3. What happened to the corn?

4. Why does Ben's father want to buy a cat?

Name ____

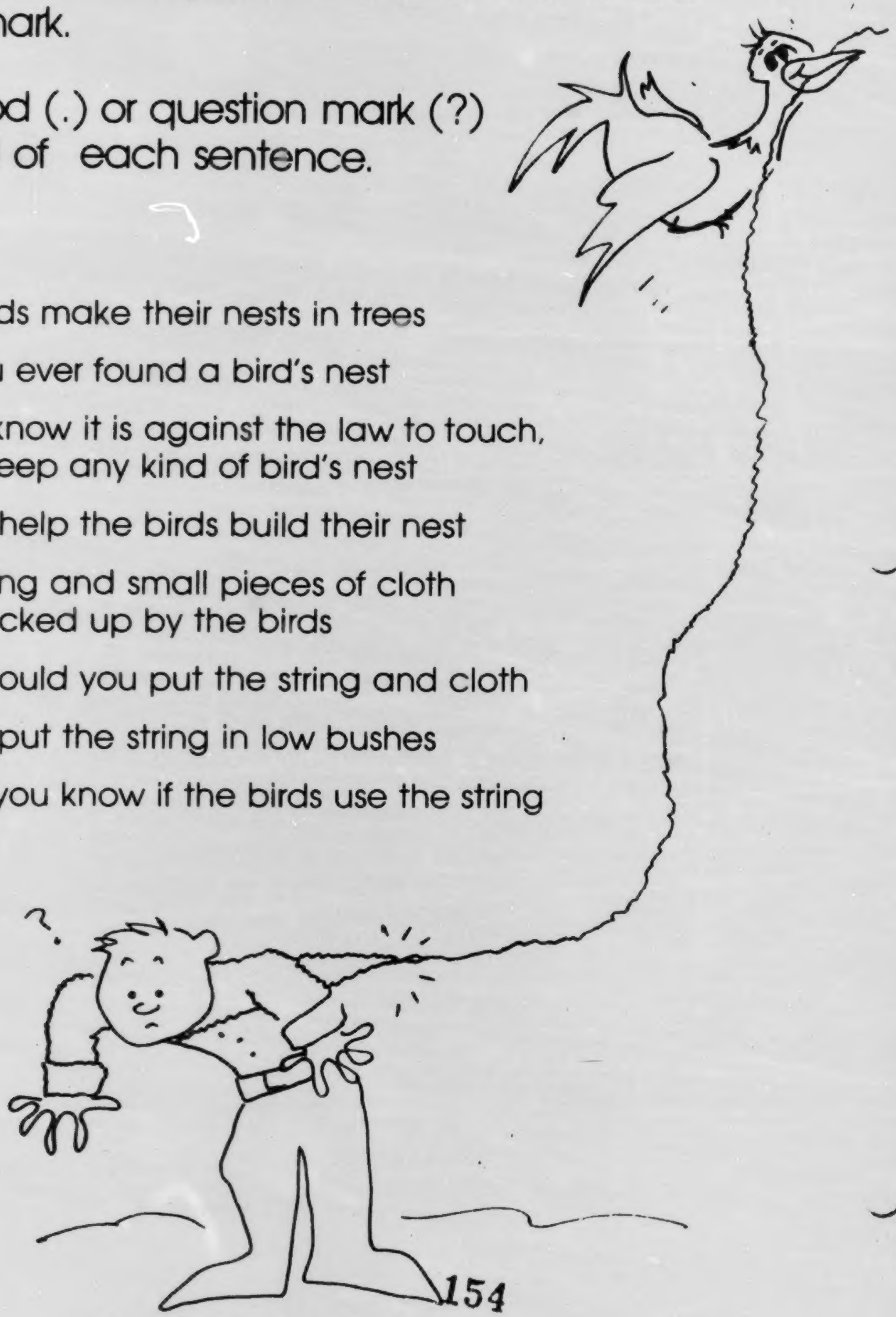
_ _

____

Sentences that ask questions should end with a question mark.

Put a period (.) or question mark (?) at the end of each sentence.

1. Many birds make their nests in trees
2. Have you ever found a bird's nest
3. Did you know it is against the law to touch, take or keep any kind of bird's nest
4. You can help the birds build their nest
5. Bits of string and small pieces of cloth will be picked up by the birds
6. Where should you put the string and cloth
7. You can put the string in low bushes
8. How will you know if the birds use the string



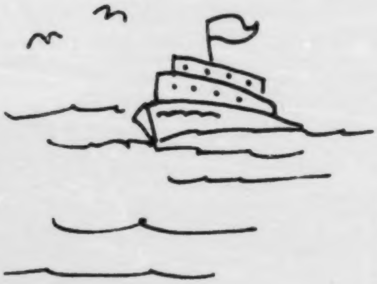
Name

We know that all plants and animals have their own habitats.

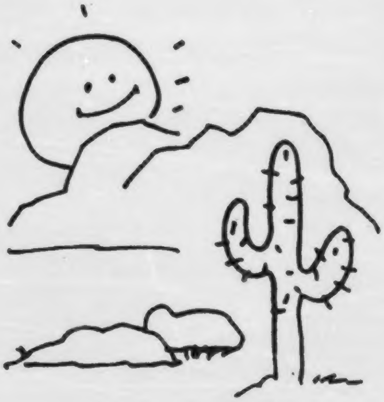
Write the names of these plants and animals in the right habitat.

whale cactus bear tortoise

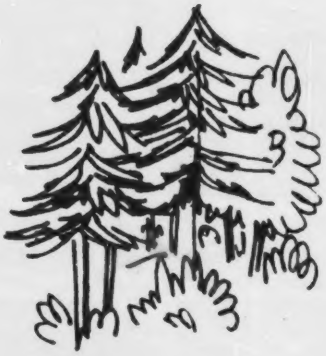
squirrel lizard seaweed deer seal



OCEAN



DESERT



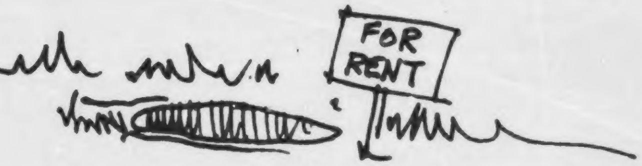
FOREST

Name ______________________

Habitats

Plants and animals have many kinds of homes. These homes where they live and grow best are called their habitats. Every animal and plant has its very own habitat.

1. An animal that lives in a cold ______________ is the polar bear. (place) (places)
2. The polar bear has lots of ______________ to keep him warm. (fur) (furs)
3. ______________ live under the ground. (Worm) (Worms)
4. A mole lives under the ______________, too. (ground) (grounds)
5. Squirrels make their ______________ in the holes of trees. (nest) (nests)
6. The cactus plant ______________ best in hot dry places. (grow) (grows)
7. Beavers build their ______________ in the middle of ponds and streams. (home) (homes)
8. The beaver makes his home out of ______________ and tree limbs that he has cut down. (stick) (sticks)



Name

Directions: Use these words to complete the sentences.

land water habitat sea place

1. Some animals live in the ___ ___ ___ ___ ___.
   1 2 3 4 5

2. Seals, whales and fish live in the ___ ___ ___.
   6 4 2

3. Other animals live on the ___ ___ ___ ___.
   7 2 8 9

4. Each animal has its own special ___ ___ ___ ___ ___.
   10 11 2 12 4

5. An animals home is called its ___ ___ ___ ___ ___ ___ ___.
   13 2 14 15 3 2 3

Write the numbered letters on the spaces below to answer the riddle.

What animal do you look like when you take a bath?

___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ !
2 7 15 3 3 7 4 14 4 2 5

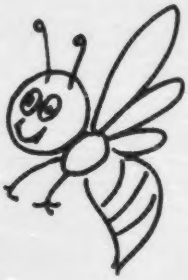
Name ______________________________

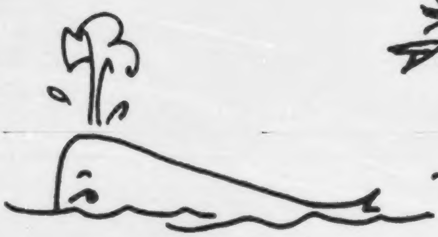
Directions: Use these words to complete the rhymes.

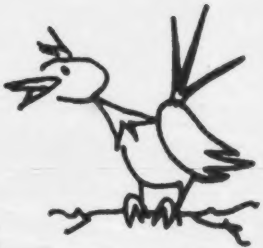
bees snails rats dogs seals

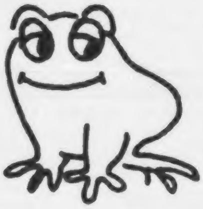
1. Some rivers have slippery eels.
   Some oceans have fast swimming ____________ .
2. The biggest sea animals are whales.
   Slow moving garden animals are ____________ .
3. Croaking at night comes from frogs.
   Barking at night comes from ____________ .
4. Some people have several cats
   to chase away the mice and ____________ .
5. A dog may be scratching because of fleas.
   Sweet honey is made by ____________ .

Draw a line from the animal to the place where he lives.









tree pond ocean hive

Name ______________________________

Left and Right

Up and Down

O	U	$\boxed{D}$	S	$\boxed{R}$	E	L	R	E
K	C	L	O	O	M	A	A	V
L	A	E	$\boxed{M}$	B	I	$\boxed{C}$	E	R
P	R	$\boxed{S}$	A	X	N	T	$\boxed{B}$	S

1. This animal makes its home in a tree.
   $\boxed{R}$, down down, right, down. R ___ ___ ___ ___

2. Here is an animal that lives under the ground.
   $\boxed{M}$, up, left, down. M ___ ___ ___

3. He makes his house in the middle of a pond.
   $\boxed{B}$, up, up, right, up, left. B ___ ___ ___ ___ ___

4. This animal lives in the ocean.
   $\boxed{S}$, up, left, left. S ___ ___ ___

5. This animal can live in the water and on the land.
   $\boxed{D}$, left, down, left. D ___ ___ ___

6. Here is an animal that can live in a hot, dry land.
   $\boxed{C}$, up, left, up, right. C ___ ___ ___ ___

Name

Write these words in A B C order.

sun 1.

water 2.

gas 3.

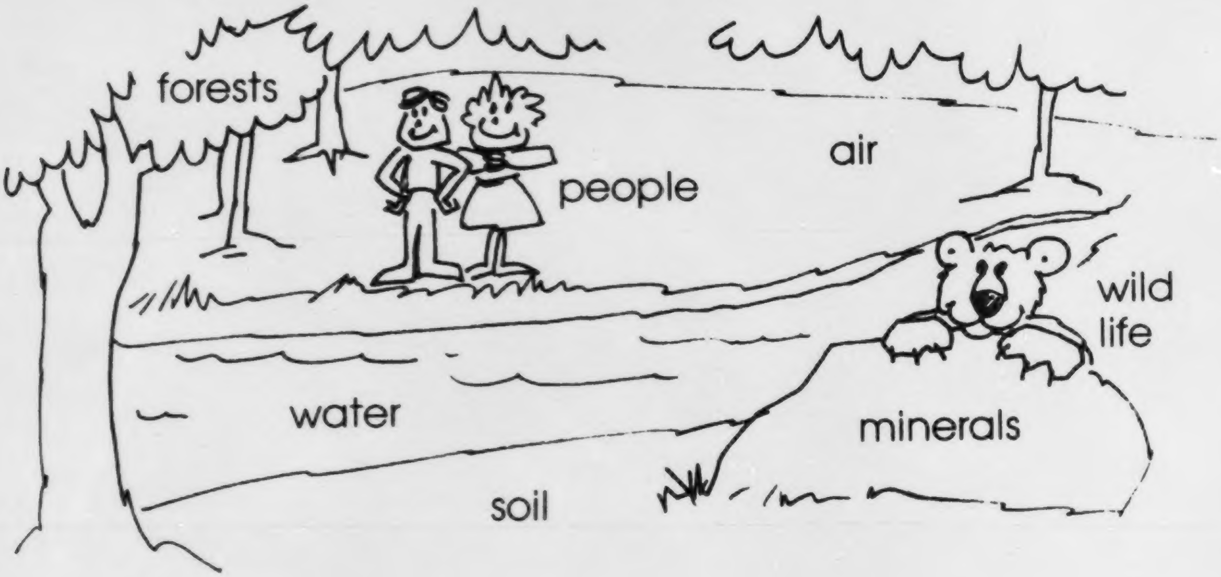
litter 4.

air 5.

dirt 6.

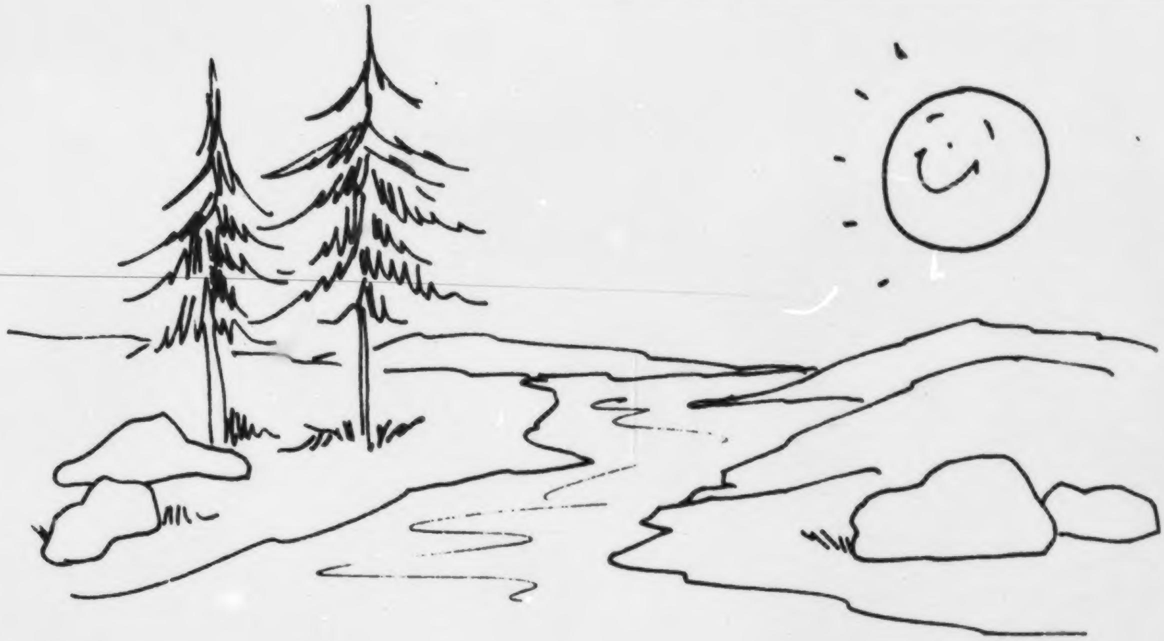
Name ______________________________

Here are seven of our natural resources. Write the name of the correct natural resource in the blank space in each sentence.



1. We need __________ to drink, to bathe in, and to wash clothes in.
2. Plants, animals, and people need __________ to breathe.
3. We need __________ to grow plants in.
4. Salt, chalk, and silver are some of the __________ we use.
5. __________ need to use other natural resources wisely and to save them for the future.
6. We use our __________ for wood to build houses and furniture.
7. Rabbits, bears, and deer are part of our __________.

Name ______________________________



Natural Resources

Natural resources are things we get from nature. Water is a natural resource. The sun is another natural resource. Trees and minerals are natural resources, too.

We use our natural resources to make the many things we use everyday. They also give us energy and power.

Write "yes" or "no" after each question.

1. Is a river a natural resource? ______________________
2. Is sunlight a natural resource? ______________________
3. Is a plastic cup a natural resource? ________________
4. Is wood a natural resource? ________________________
5. Is a book a natural resource? ______________________
6. Is gold a natural resource? ________________________

Name

Glass

The glass jars and bottles that food comes in were once plain old sand. At a glass factory, the sand is heated in large vats until it melts. Then the melted sand is mixed with baking soda and chalk. This makes glass.

While the glass is hot, it can be made into different shapes. It can be rolled flat for windowpanes or poured into molds to make cups, vases, bowls, and other useful things.

Old glass jars and bottles can be melted again to make new glass.

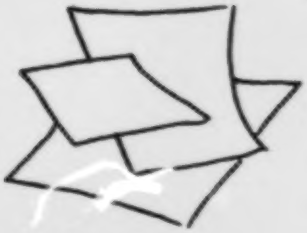
Write yes in front of the sentences that are correct.

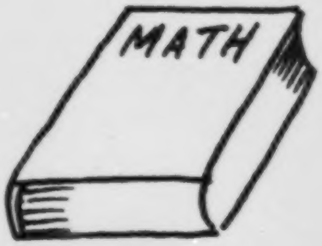
Write no in front of the sentences that are not correct.

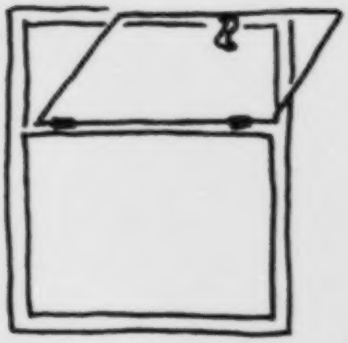
1. Glass is made from sand.
2. The sun melts the sand at the beach.
3. Glass is rolled flat to make light bulbs.
4. Glass is made into cups and bowls while it is hot.
5. Old glass can be melted again to make new glass.

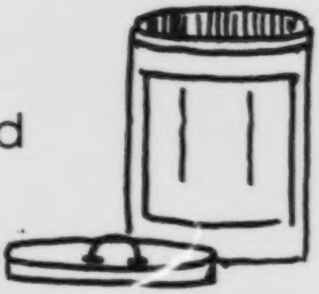
Name ______________________

Here are some things in your classroom. Some are made from plants. Some are made from metal. And some are made from sand. Draw a line from the picture to the word or words that tell what it is made from.

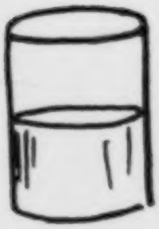


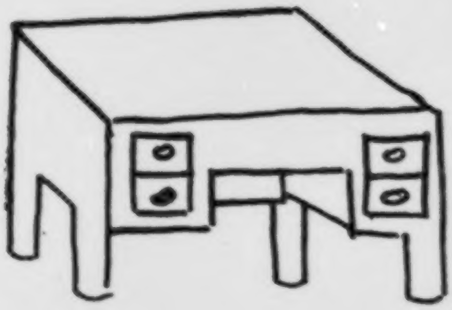


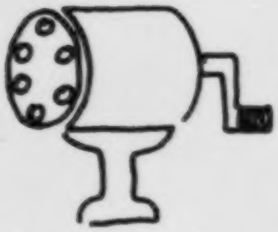




Plants Metal Sand





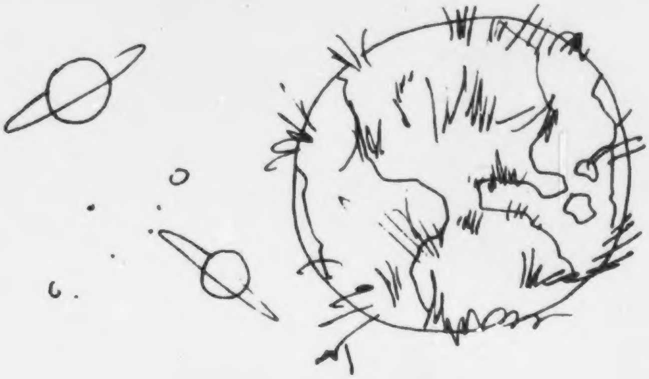


Name

Grass

Grass is the largest crop on the earth. Grass gives us the food for our animals so we can have meat, milk, eggs, and wool. Wheat, rice, sugar cane, oats, and corn are grasses, too.

Grass keeps the soil from washing or blowing away. It also puts important things into the soil so we can grow better fruits and vegetables to eat.



OUTER SPACE
LAWN MOWER
COMPANY

Write the following words in the correct boxes.

milk	nuts	grass	rice	oats
fruit	cob	cane	meat	eggs

	a	e	i	o	u
long vowel					
short vowel					

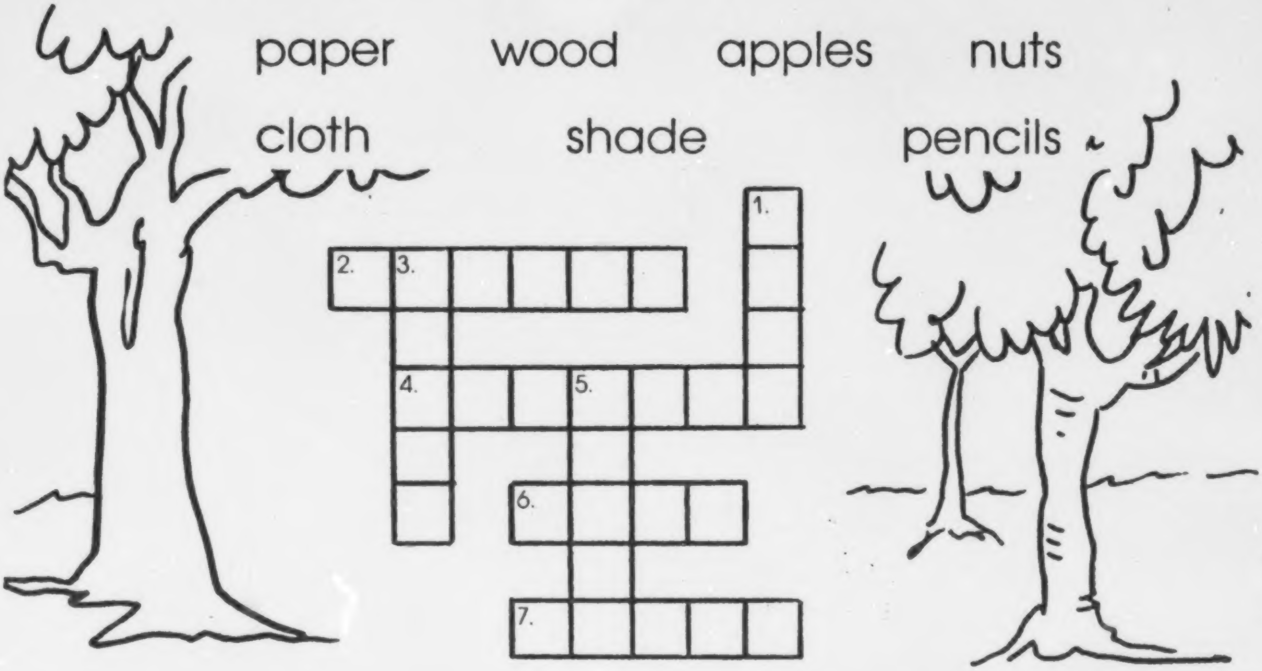
Name

Trees

Trees are one of our natural resources. They give us many things. Use the names of these things we get from trees to finish the puzzle.

paper wood apples nuts

cloth shade pencils



Clues:

Words Across

2. These are juicy and good to eat.
4. You use these to write with.
6. This is used to build houses, tables, and sometimes toys.
7. A good place to sit when it's hot.

Words Down

1. Most of these have hard shells.
3. You write on this.
5. This is used to make clothes.

Can you think of other things that come from trees? Write as many as you can.

Name

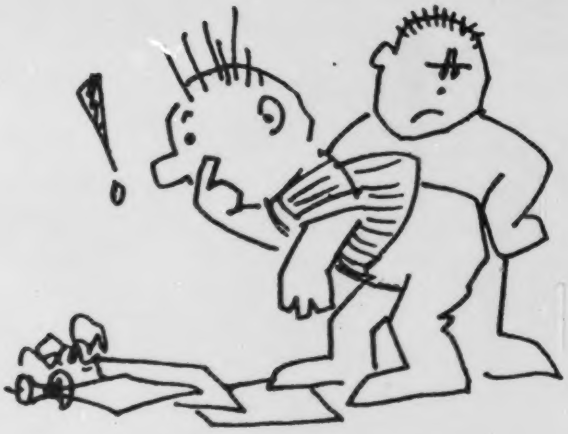
Directions: A word in each sentence is all mixed up. Unscramble the letters and write the word correctly on the blank space.

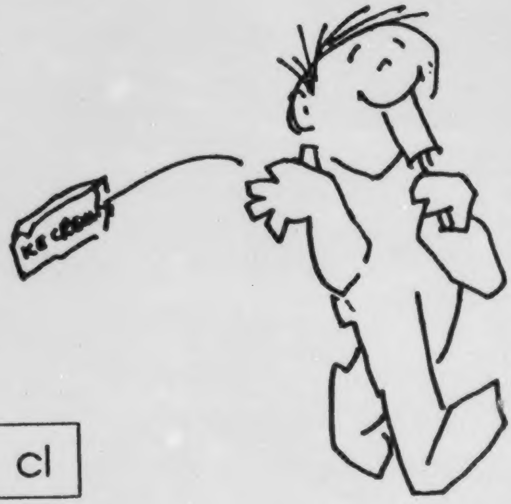
1. Most paper is made from doow. ______
2. The pages of your book were once a eret. ______
3. Nasd is used to make glass. ______
4. Plastic is made from iol. ______
5. Minerals give us many matles. ______
6. We need to vesa our natural resources. ______
7. We should be careful not to teaws them. ______

Name ______________________________

____

____





w l s cl

Use the letters to make words that match the meanings.

_ _ean — How we should keep our environment.

_itter — Paper thrown on the ground.

_aste — What we should be careful not to do.

_mog — Dirty air.

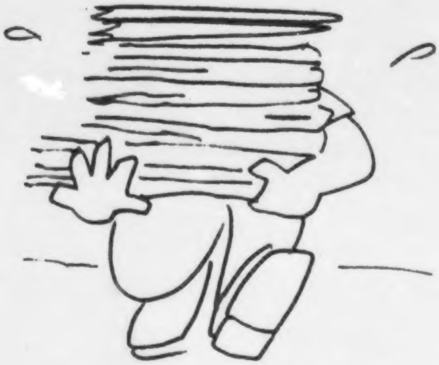
Fill in the spaces with letters to make a word.

1. Paper is made from _ _ants.
2. When we use both sides of a paper, we are saving _ _ees.
3. _and is used to make glass.
4. Glass bottles and _ars can be used over and over again.
5. We use oil to make _ _astic.
6. Plastic cannot be _elted to use again.

Name ______________________________

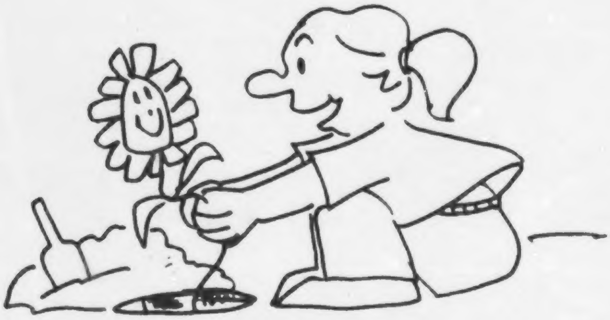
Many people are helping to keep our environment clean.

Directions: Look at each picture. Then draw a line under the answer to the question.



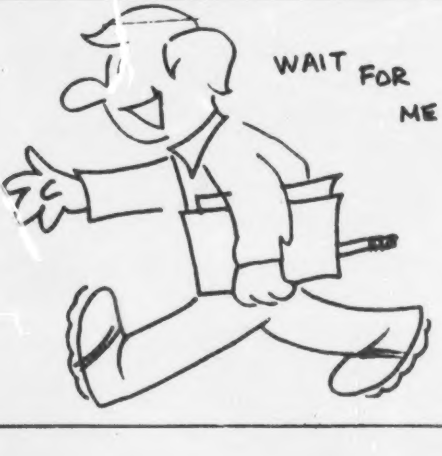
How is Sarah helping?

She is saving newspapers to recycle.
She is reading a newspaper.
Sarah is making a hat.



How is Marie helping?

Marie is building a house.
She is petting her dog.
Marie is planting flowers.



How is Bill helping?

He is riding in a car.
He is walking to school.
He is eating ice cream.

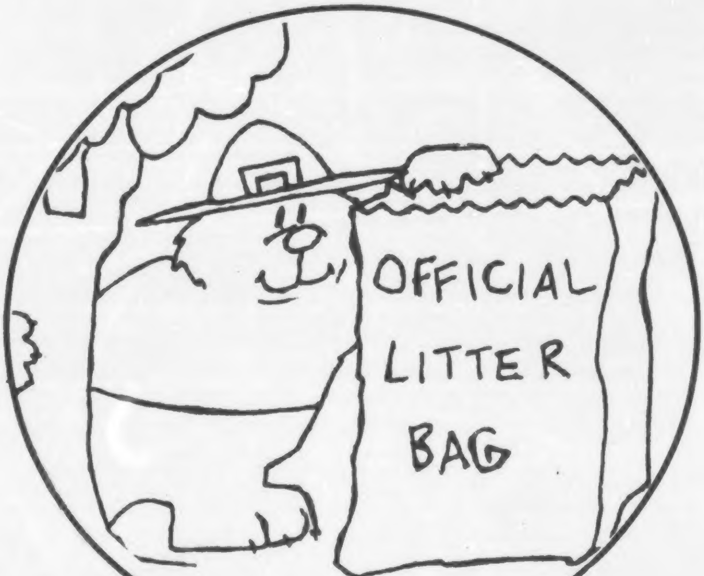
Name ________________________________

Circle the compound words in this story.

DON'T BE A LITTERBUG

Litter along our highways and on our playgrounds is an ugly sight. We must do our part to keep litter off the roadside, out of our campgrounds, and in the wastebasket. You can help by making and using a litterbag for your car.

Color the picture. Cut it out and paste it on a small paper bag. Put the bag in your car to hold your litter.



Name ______________________________

Each alphabet has a letter missing. Write the missing letters on the spaces below.

Find out how you can keep our country beautiful.

1. A B C D E F G H I J K L M N O Q R S T U V W X Y Z
2. A B C D E F G H J K L M N O P Q R S T U V W X Y Z
3. A B D E F G H I J K L M N O P Q R S T U V W X Y Z
4. A B C D E F G H I J L M N O P Q R S T U V W X Y Z
5. A B C D E F G H I J K L M N O P Q R S T V W X Y Z
6. A B C D E F G H I J K L M N O Q R S T U V W X Y Z
7. A B C D E F G H I J K M N O P Q R S T U V W X Y Z
8. A B C D E F G H J K L M N O P Q R S T U V W X Y Z
9. A B C D E F G H I J K L M N O P Q R S U V W X Y Z
10. A B C D E F G H I J K L M N O P Q R S U V W X Y Z
11. A B C D F G H I J K L M N O P Q R S T U V W X Y Z
12. A B C D E F G H I J K L M N O P Q S T U V W X Y Z

Answer ___ ___ ___ ___   ___ ___   ___ ___ ___ ___ ___ ___
1. 2. 3. 4.   5. 6.   7. 8. 9. 10. 11. 12.

Name

Copy these words in cursive.

litter

smog

waste

habitat

recycle

pollution

ecology

conservation

Name

Directions: Mark the circle in front of the word in each box that is not spelled correctly.

1.
- ○ saving
- ○ water
- ○ bottel
- ○ myself

2.
- ○ leaf
- ○ papir
- ○ car
- ○ trash

3.
- ○ pick
- ○ durt
- ○ trees
- ○ lemon

4.
- ○ clene
- ○ pollution
- ○ truck
- ○ sun

5.
- ○ rain
- ○ clode
- ○ litter
- ○ weather

6.
- ○ orange
- ○ gas
- ○ river
- ○ animul

7.
- ○ plints
- ○ walking
- ○ wind
- ○ smog

8.
- ○ dirty
- ○ yellow
- ○ waste
- ○ earht

9.
- ○ duste
- ○ recycle
- ○ dripping
- ○ snow

10.
- ○ flowers
- ○ soot
- ○ smok
- ○ ocean

11.
- ○ seven
- ○ air
- ○ forrest
- ○ beaver

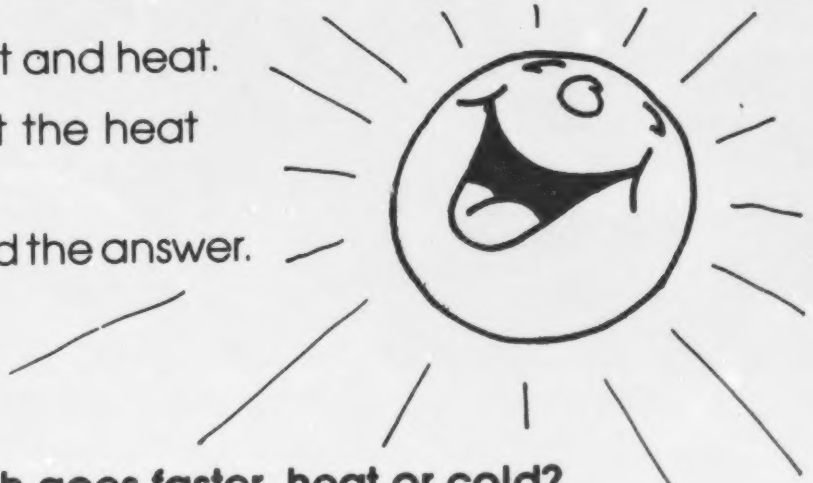
12.
- ○ cars
- ○ frute
- ○ lake
- ○ green

Name ______________________________

The SUN gives us light and heat.

This is a riddle about the heat from the sun.

Fill in the letters to find the answer.



Which goes faster, heat or cold?

Write the letter that comes after:

G ___
D ___
A
S ___,
A ___
D ___
B ___
A
T ___
R ___
D ___
X ___
N ___
T ___

Write the letter that comes before:

___ D
___ B
___ O
___ D
___ B
___ U
___ D
___ I
___ D
___ P
___ M
___ E!

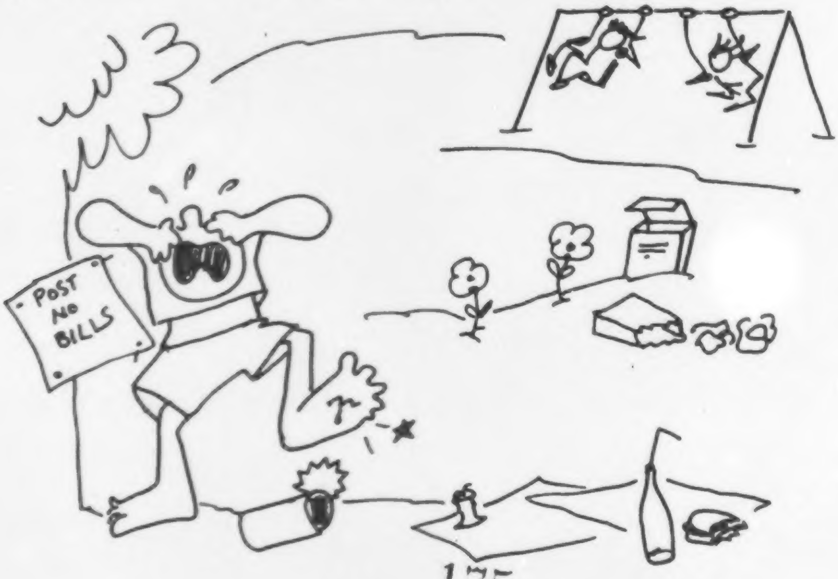
Name ______________________________

Directions: Draw a line under the contraction in each sentence.

Write the two words that mean the same as the contraction on the blank spaces.

1. Trash isn't nice to see in parks or playgrounds. ____ ____
2. Don't throw litter on the ground. ____ ____
3. Papers and trash aren't good for plants or animals. ____ ____
4. If you can't find a garbage can, take your trash home with you. ____ ____
5. It wouldn't be fun to play in a park covered with litter. ____ ____

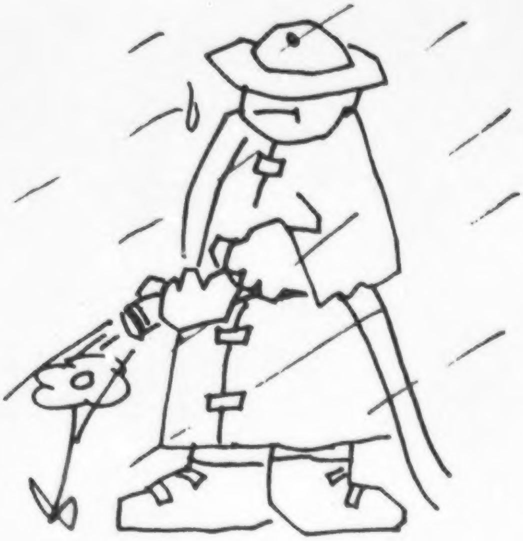
Color the picture. Color over the parts that are not nice to see.

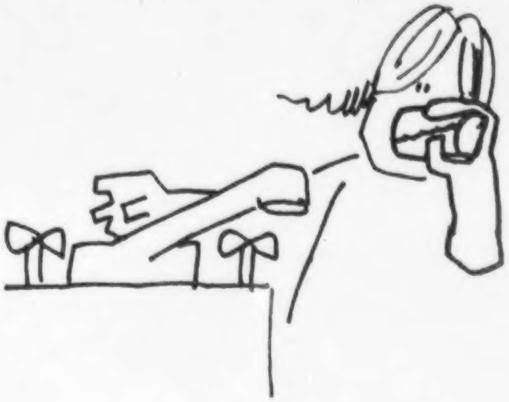


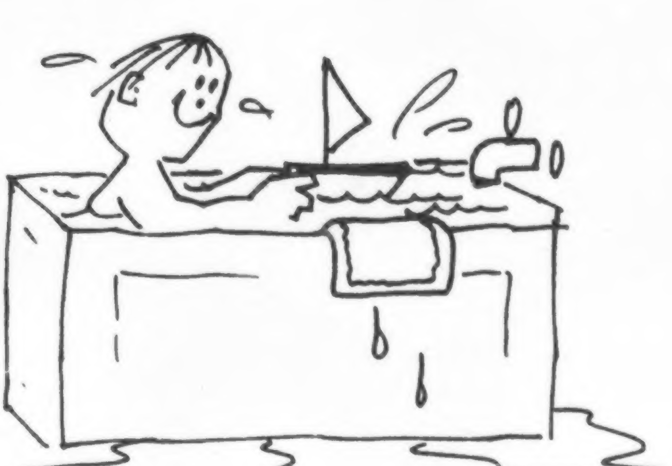
Name ______________________________

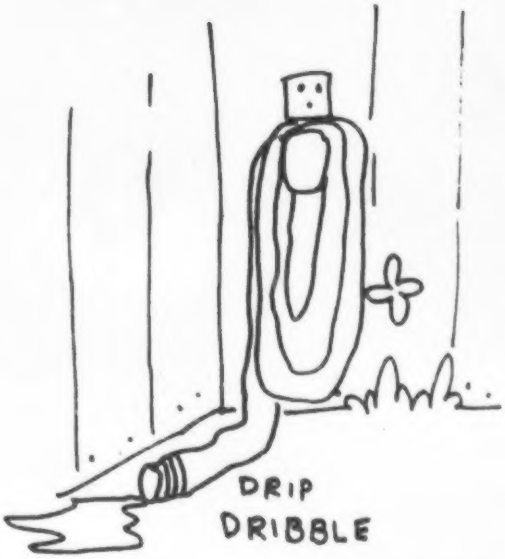
Water is our most important natural resource. People, other animals, and plants cannot live without clean water. It is important that we do not waste or pollute our water.

Put an X on the pictures that show water being wasted.



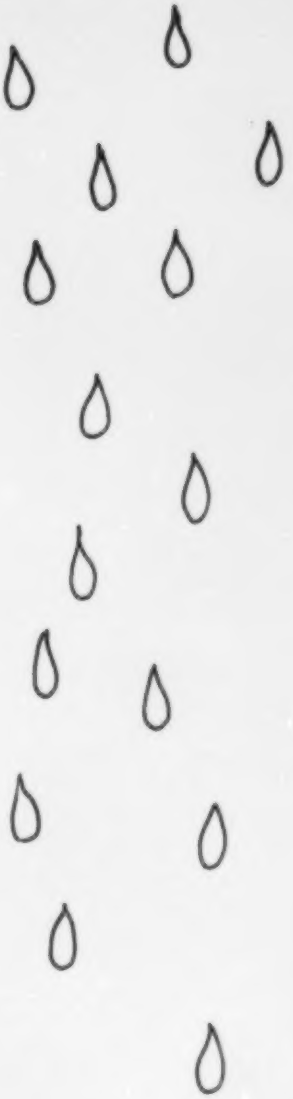






Name ______________________________

Directions: A sentence is a complete thought. Write an "S" before each complete sentence you find below.



Water is everywhere.

____ 1. The earth has a lot of water.

____ 2. We need water to drink.

____ 3. In the ocean.

____ 4. There is water in the ground.

____ 5. Pails of water.

____ 6. The water in the ocean is salty.

____ 7. There is even water in the air.

____ 8. A large blue lake.

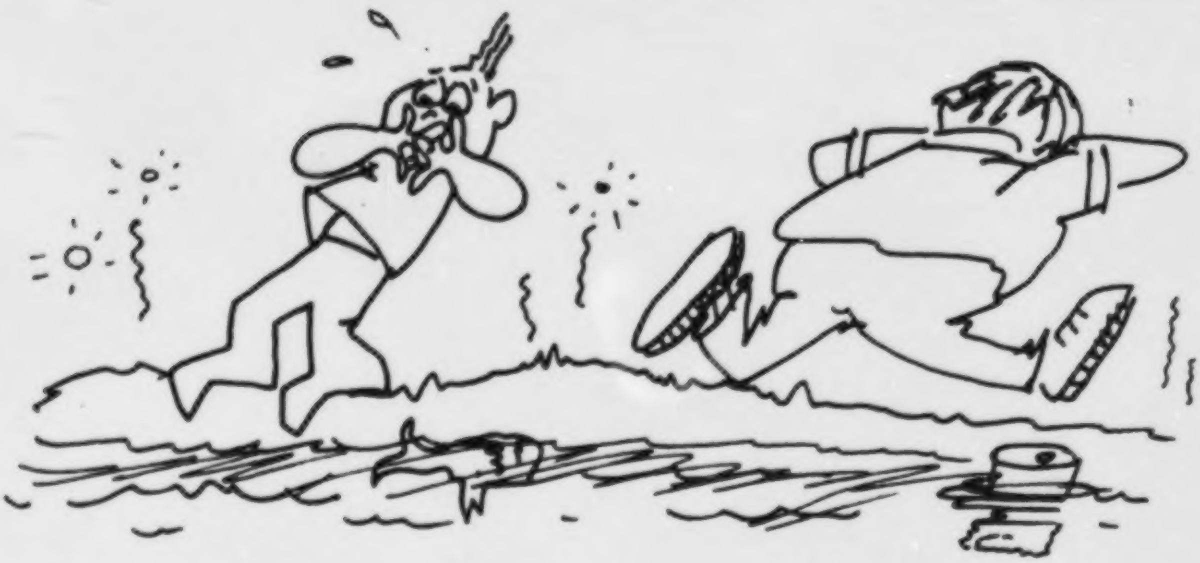
____ 9. All animals and plants need water.

____10. There is water in lakes and streams.

____11. Running water from the hose.

____12. Water is wet.

Name



Circle the word that belongs in each sentence.

1. Fish do not _________ well in dirty water.
live lives living

2. No one _________ to drink water that is not clean.
want wants wanting

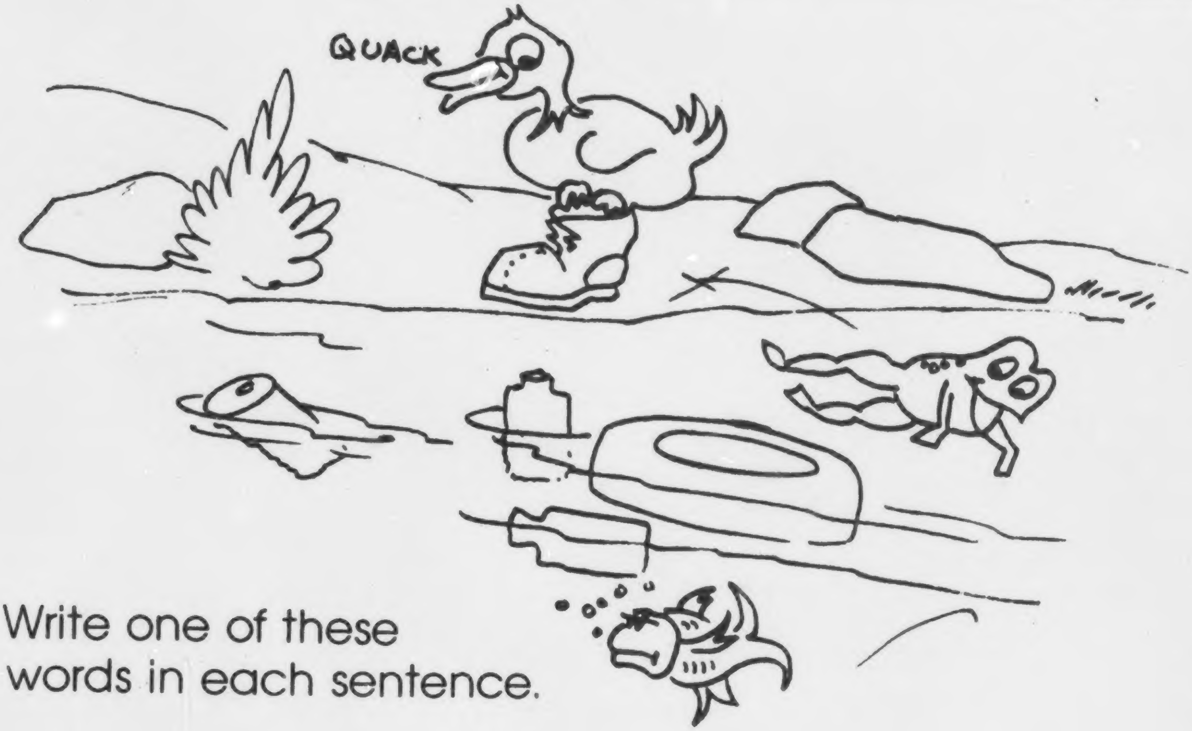
3. _________ in dirty water is no fun.
Swim Swims Swimming

4. Don't _________ papers into rivers or lakes.
throw throws throwing

5. Dirty water is _________ polluted water.
call calling called

6. Everyone should work to _________ our water clean.
keep keeps keeping

Name



Write one of these words in each sentence.

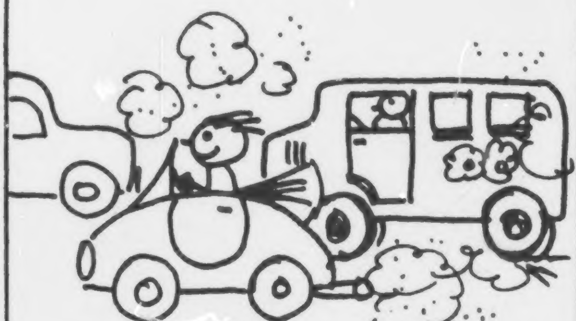
over in beside on under

1. There is litter ____________ the water.
2. The frog is jumping ____________ an old tire.
3. There are bottles ____________ the tire.
4. The fish is trying to swim ____________ the litter.
5. The duck is sitting ____________ an old shoe.

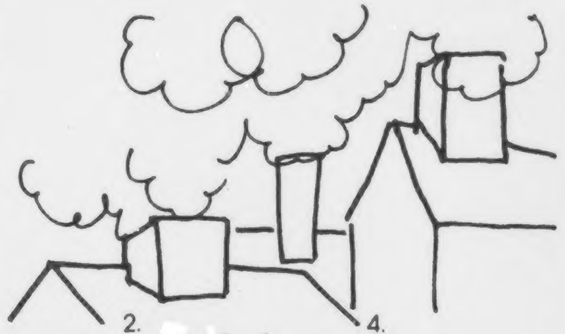
How could we help the fish, the duck, and the frog?

Name ______________________________

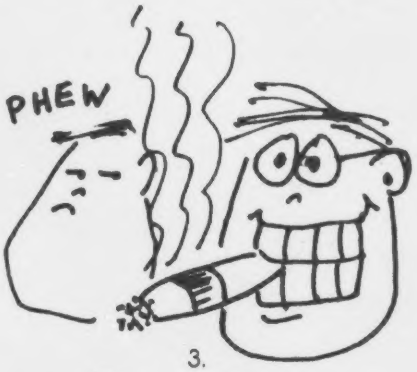
Write the names of these things that cause air pollution.



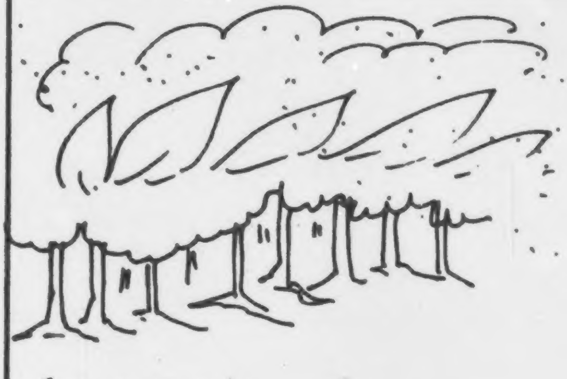
1.
c _ _ _ _



2. 4.
s _ o k i _ _
chimneys



3.
p _ _ p _ _



forest f _ _ _ _ _

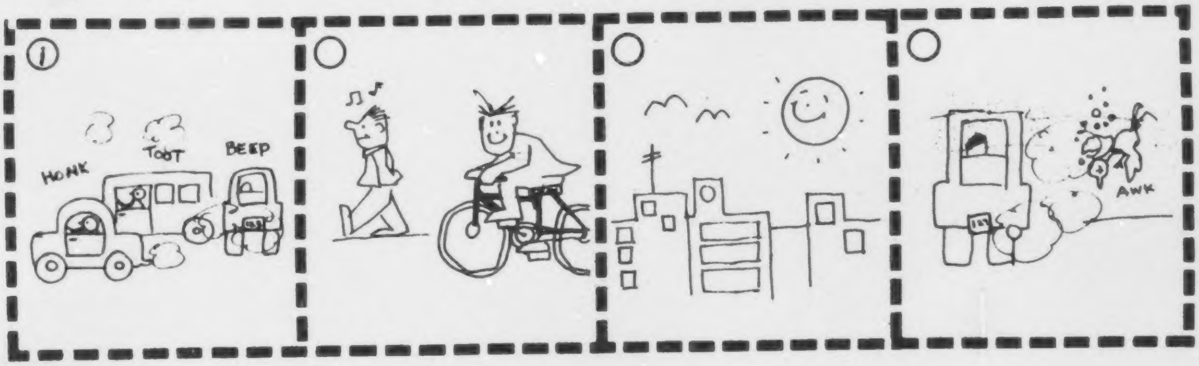
What do we call dirty air? Use the letters with numbers under them to make the word.

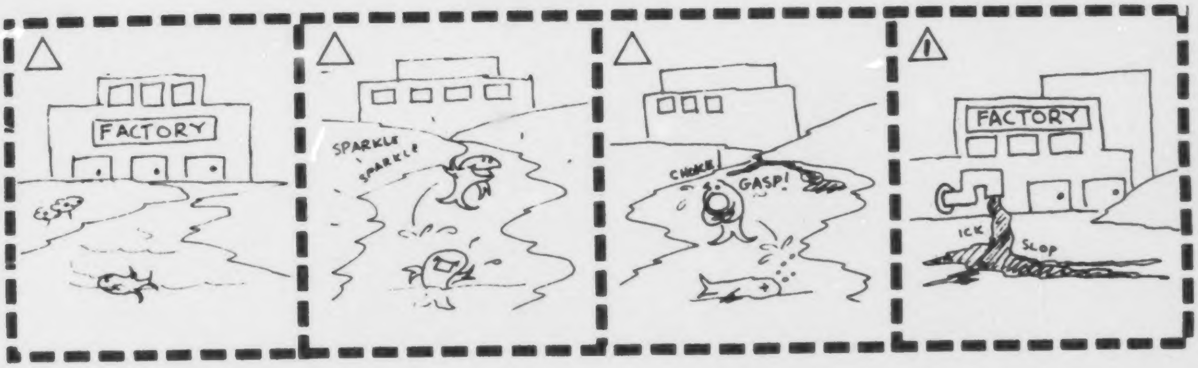
_ _ _ _
1. 2. 3. 4.

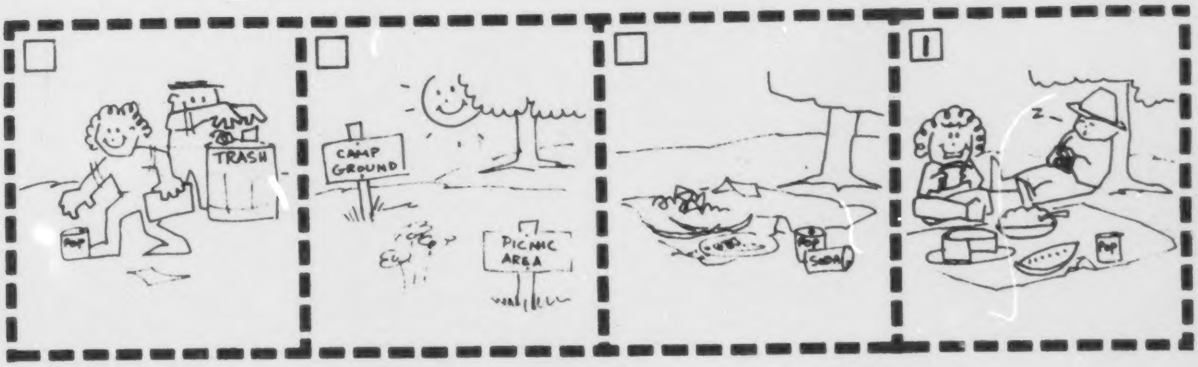
Name ______________________________

Pollution Solutions — Cut out the pictures on the dotted lines and paste them in the right order.

○ = Air △= Water □= Earth


HONK
TOOT
BEEP
AWK


FACTORY
SPARKLE
SPARKLE
CHOKE
GASP!
FACTORY
ICK
SLOP

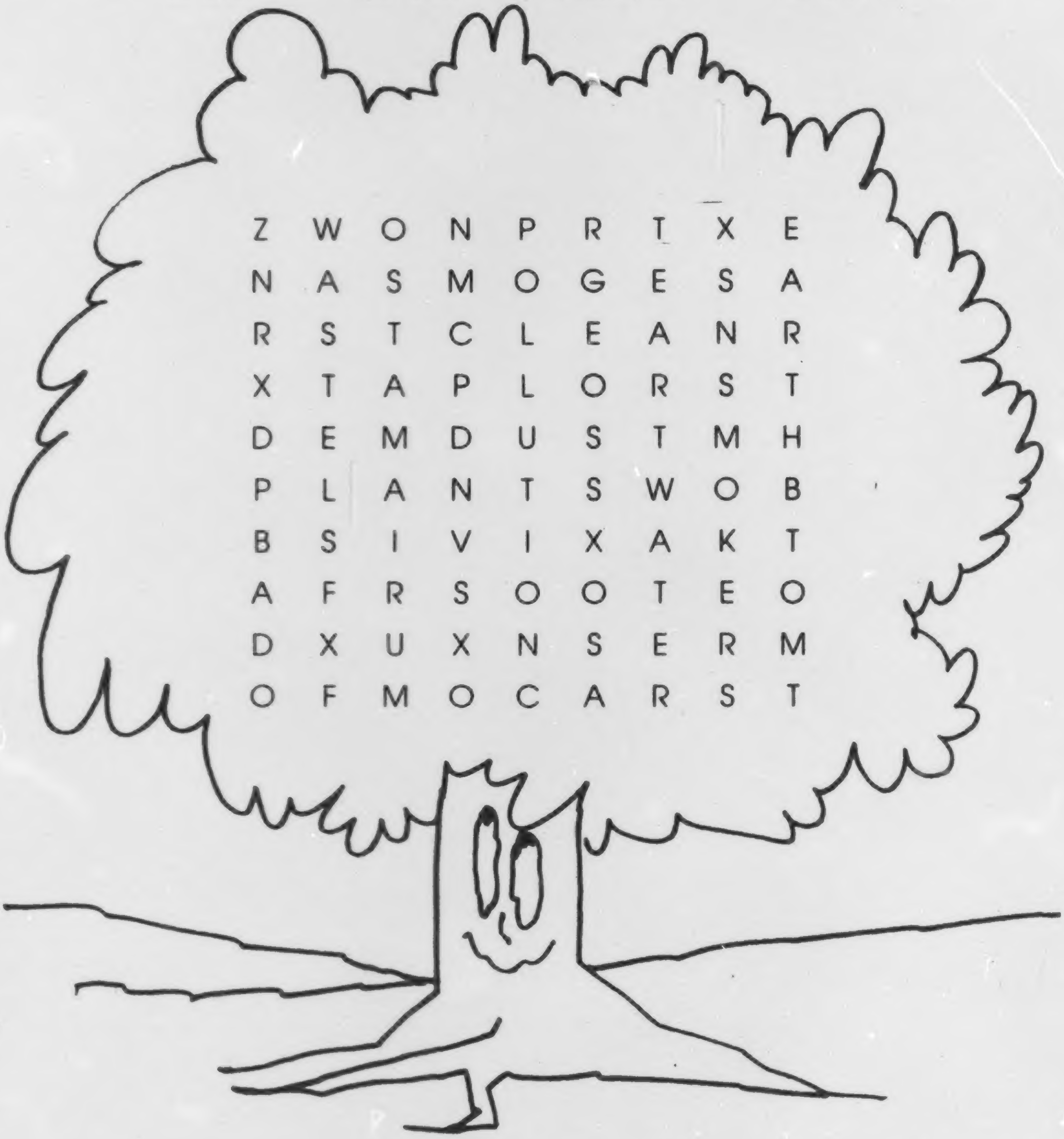

TRASH
CAMP GROUND
PICNIC AREA
SODA

Name

Word Hunt

Circle these ecology words as you find them in this puzzle.

WASTE SOOT POLLUTION WATER
AIR PLANTS SMOG SMOKE
DUST CARS CLEAN EARTH



Z	W	O	N	P	R	T	X	E
N	A	S	M	O	G	E	S	A
R	S	T	C	L	E	A	N	R
X	T	A	P	L	O	R	S	T
D	E	M	D	U	S	T	M	H
P	L	A	N	T	S	W	O	B
B	S	I	V	I	X	A	K	T
A	F	R	S	O	O	T	E	O
D	X	U	X	N	S	E	R	M
O	F	M	O	C	A	R	S	T

Name

Draw a line from the beginning of the sentence to the right ending.

All plants and animals

Cans and bottles

Cars and trucks

Conservation means to

can make the air dirty.

need water to live.

can be recycled.

use things wisely.

CONSERVE
SAVE
RE-CYCLE

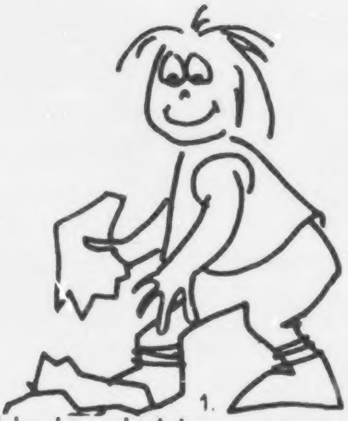
Complete the sentence with your own words.

Dirty water is

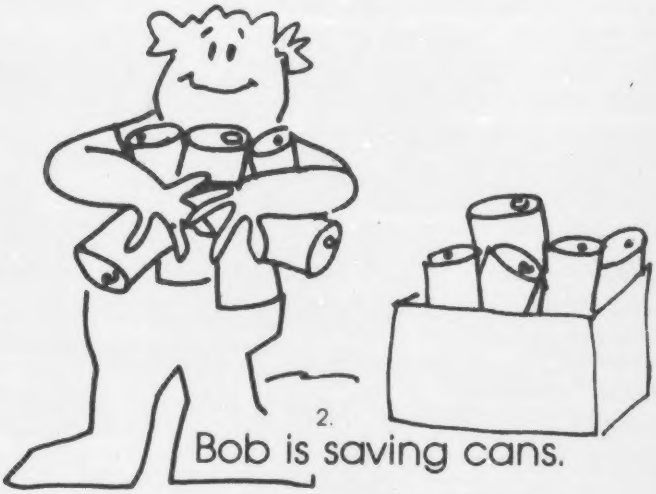
Everyone should save

We can all help to

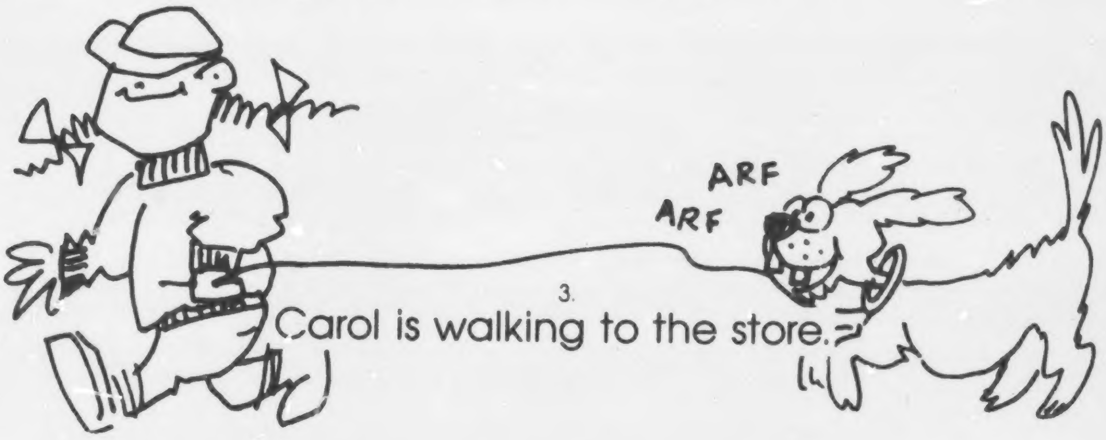
Name



1. Liz is picking up papers.



2. Bob is saving cans.



3. Carol is walking to the store.

Put 1 if it tells about what Liz is doing.
Put 2 if it tells about what Bob is doing.
Put 3 if it tells about what Carol is doing.

___ This will save gasoline.

___ This will make the playground look better.

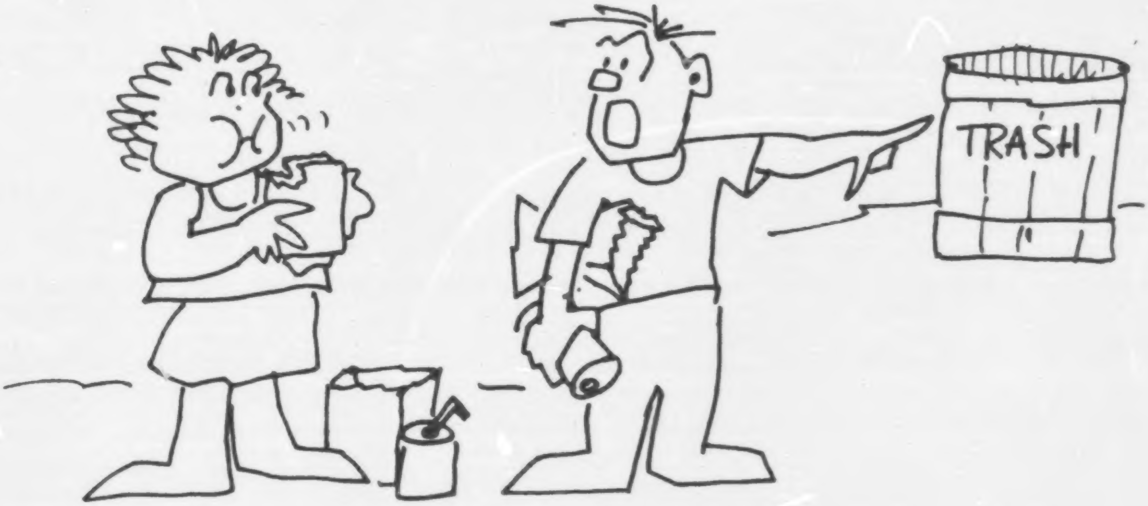
___ These will be recycled and made into new ones.

___ This can help to keep our air clean.

___ Someone has to do this when people are litterbugs.

Name ______________________________

Read the story. Number the sentences 1, 2, 3, and 4 the way they happened in the story.



Mike and Melissa went to the park. They were going to have a picnic. They brought peanut butter and jelly sandwiches, cookies, and two cans of soda.

After they ate their lunch, Melissa wanted to play on the swings. Mike thought they should put their trash in the trashcan first. Melissa did not want to be a litterbug, so they picked up the trash. Then they played on the swings.

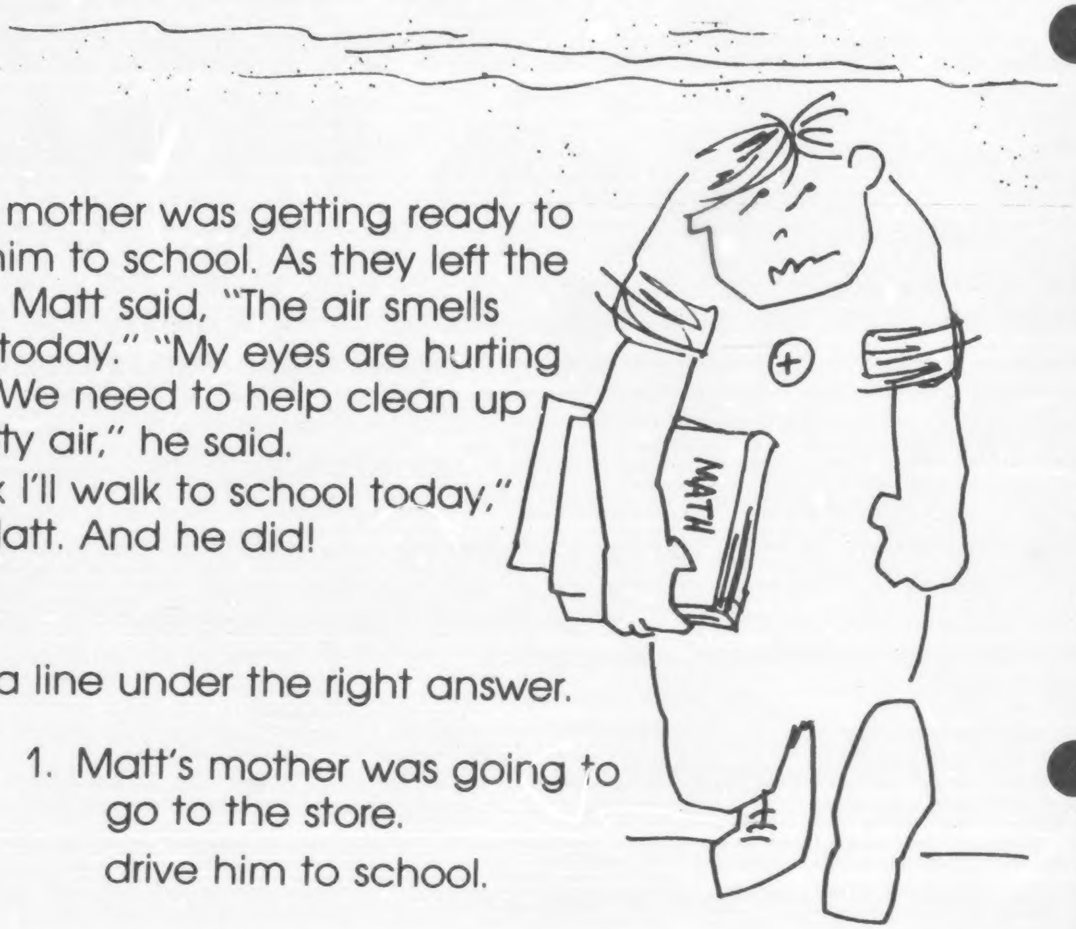
____ They ate peanut butter and jelly sandwiches for lunch.

____ Mike and Melissa went to the park for a picnic.

____ They played on the swings.

____ They put their papers and cans in the trashcan.

Name



Matt's mother was getting ready to drive him to school. As they left the house, Matt said, "The air smells funny today." "My eyes are hurting too." "We need to help clean up this dirty air," he said.
"I think I'll walk to school today," said Matt. And he did!

Draw a line under the right answer.

1. Matt's mother was going to
   go to the store.
   drive him to school.

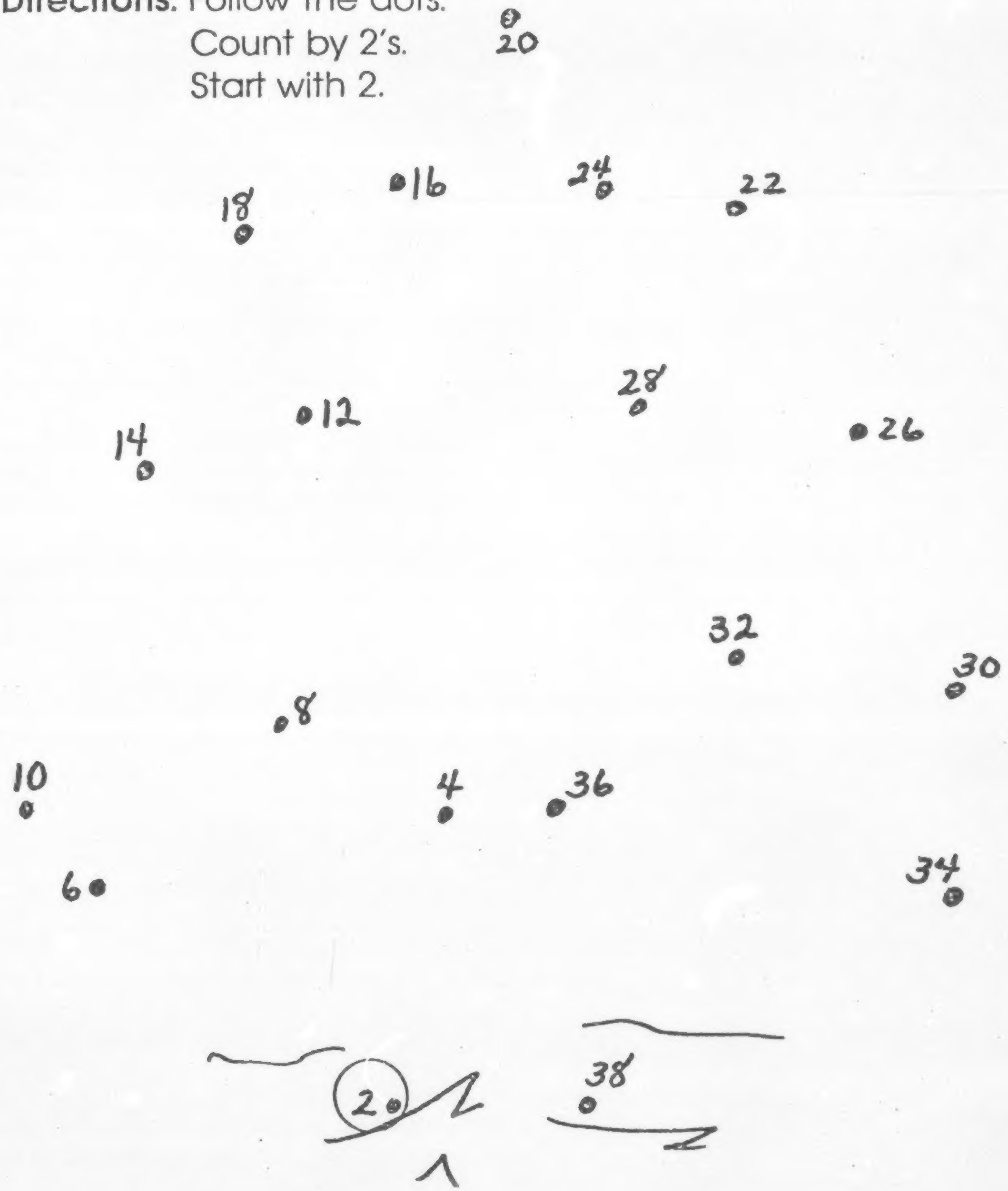
2. The dirty air was
   hurting his eyes.
   hurting his feet.

3. Matt knew that dirty air could be
   caused by cars.
   bad for plants.

4. He helped to clean up the air by
   not smelling it.
   walking to school.

Name ______________________________

Directions: Follow the dots.
Count by 2's.
Start with 2.


20
18
16
24
22
28
12
26
14
32
30
8
10
4
36
6
34
38
2

This is used to make paper.

Name ______________________________

Directions:
Find the ecology message.
Use the code to fill in the missing letters.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
I	A	V	E	T	F	O	N	U	R	P	H	L	G	S

8 +5	9 -9	10 -8	9 -6
13			
G			

12 -11

5 +8	12 -12	12 -7	11 -7

12 -8	13 -7

13 -6	10 -9	13 -9	15 -7	11 -2	13 -10

4 +6	7 +5	9 -8	13 -6	9 -5

8 -7

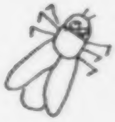
8 -4	6 +3	12 -9	11 -8

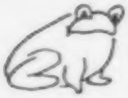
14 -8	3 +6

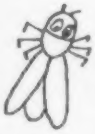
	6 +2	7 +7	6 +5
B			

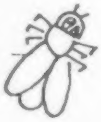
Name ______________________________

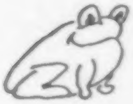
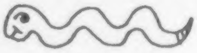
Directions:
Write a number sentence.
Give the answer.

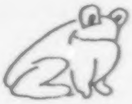
12  s.

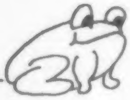
A  ate 6.

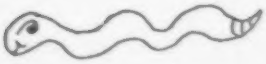
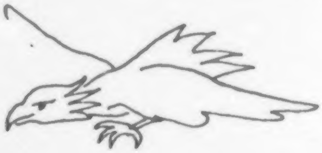
How many  s were left?

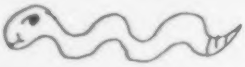
12 - 6 = __________  s.

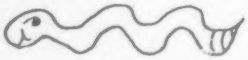
17  s. A  ate 3.

How many  s were left?

______________________ __________  s.

14  s. An  ate 7.

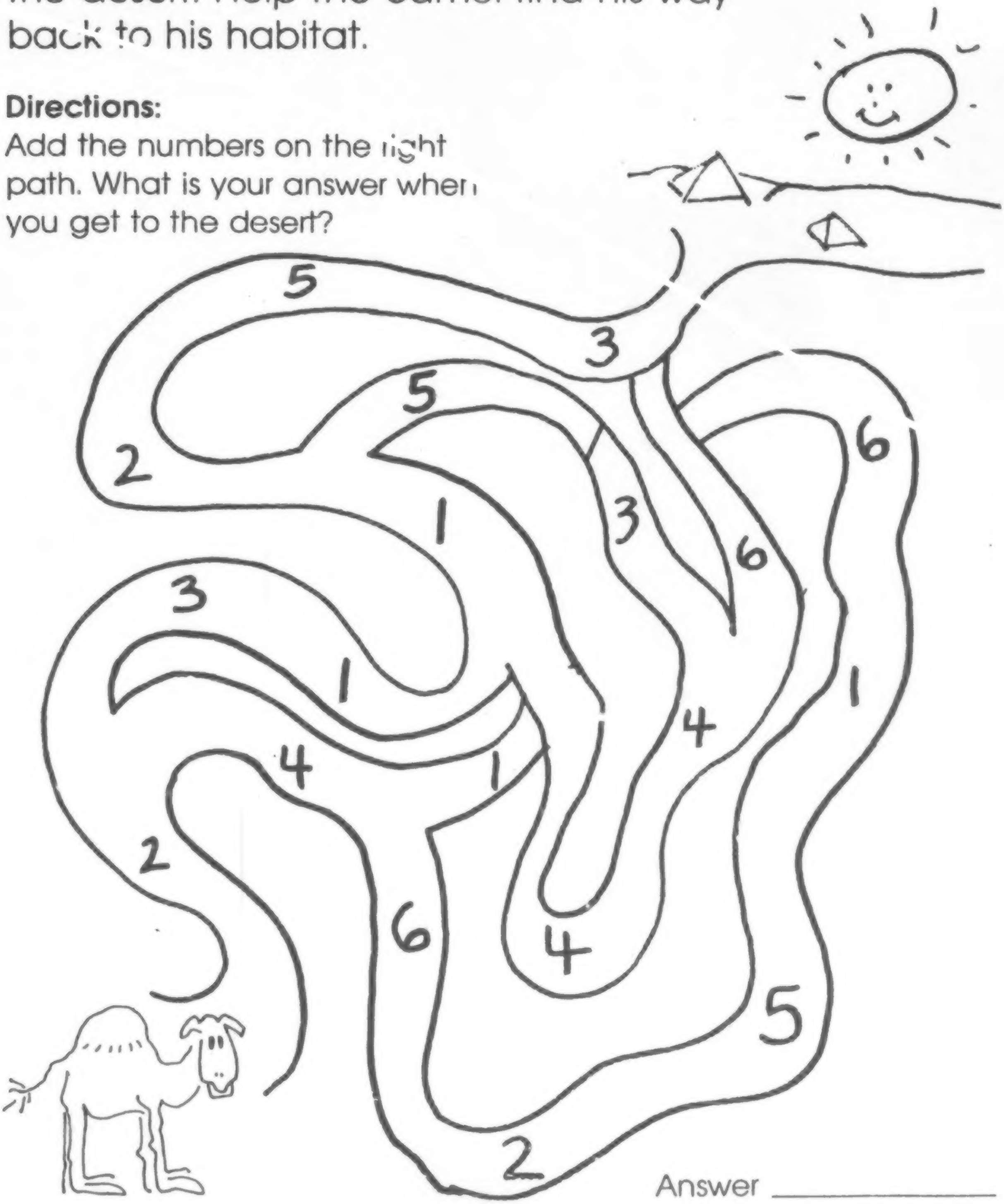
How many  s were left?

______________________ __________  s.

Name ______________________________

The camel's habitat is the desert. Help the camel find his way back to his habitat.

Directions:
Add the numbers on the right path. What is your answer when you get to the desert?


5
3
5
2
1
3
6
6
3
1
1
4
4
1
2
6
4
5
2

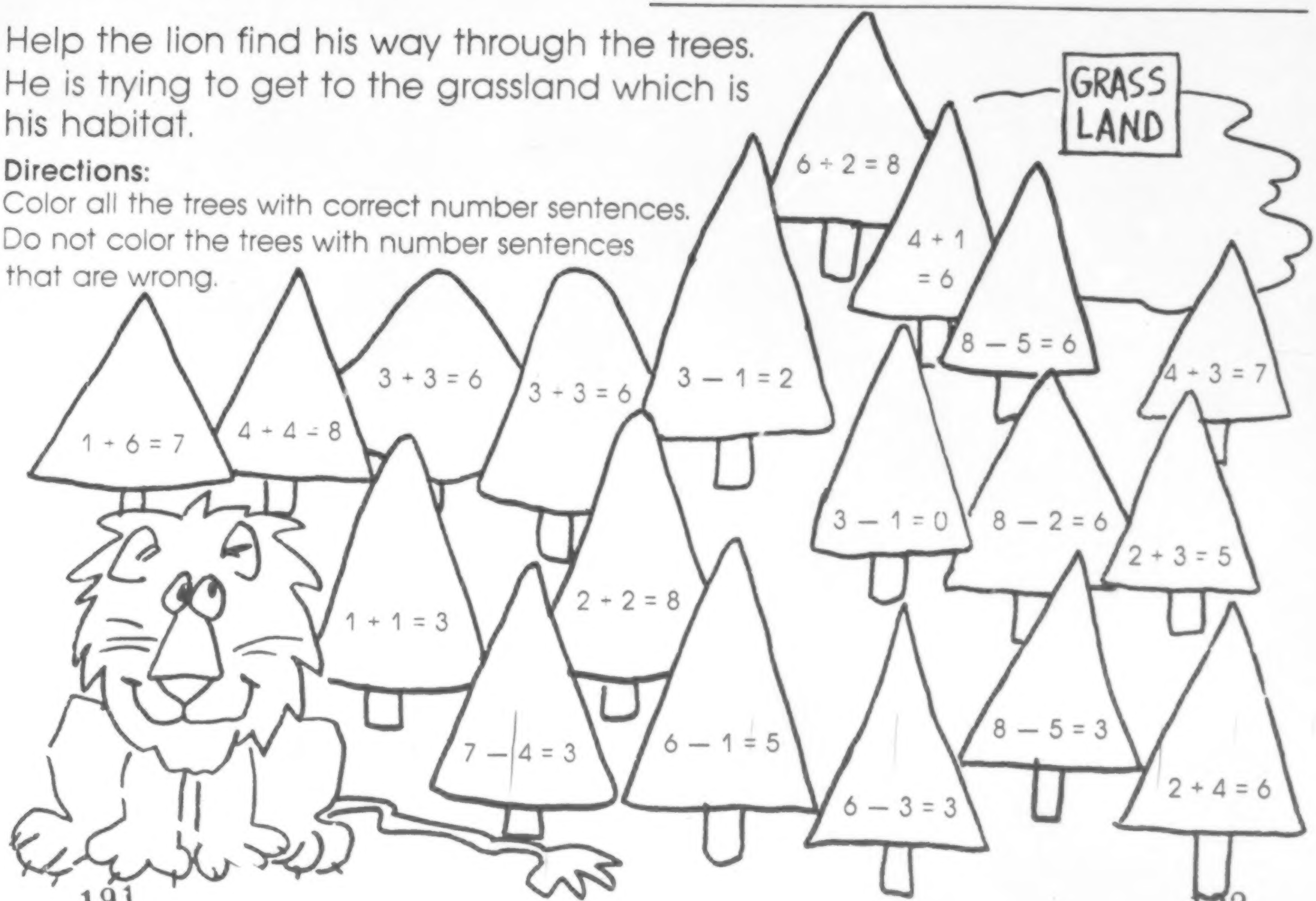
Answer ______________

Name ______________________________

Help the lion find his way through the trees. He is trying to get to the grassland which is his habitat.

Directions:

Color all the trees with correct number sentences. Do not color the trees with number sentences that are wrong.


GRASS LAND
6 + 2 = 8
4 + 1 = 6
8 — 5 = 6
4 + 3 = 7
1 + 6 = 7
4 + 4 = 8
3 + 3 = 6
3 + 3 = 6
3 — 1 = 2
3 — 1 = 0
8 — 2 = 6
2 + 3 = 5
1 + 1 = 3
2 + 2 = 8
7 — 4 = 3
6 — 1 = 5
6 — 3 = 3
8 — 5 = 3
2 + 4 = 6

Name ______________________________

- -

____

What does
Woodsy Owl say?

Directions:
Do the problems.
Use your answers to find out.

E 43 + 8	H 72 + 9	T 84 + 4	I 46 + 8
P 83 + 7	O 44 + 2	V 92 + 8	A 35 + 7
D 96 + 5	N 28 + 8	L 46 + 9	U 79 + 7

G	___	___	___	___	___	___	___	___
	54	100	51	42	81	46	46	88

___	___	___	___	___	___	___	___	___	___	___	!
101	46	36	88	90	46	55	55	86	88	51	

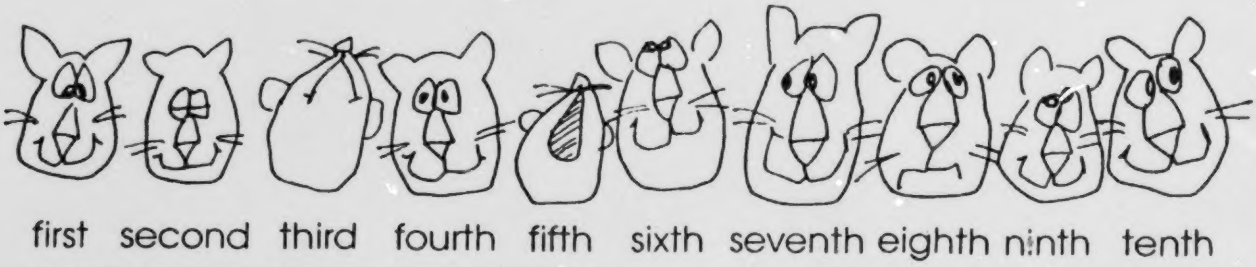
Name

Here are some examples of how the food chain works.

Directions:
Read the problem.
Do the work.

1. There were 46 ears of corn in the barn. Along came some mice who ate 14 of them. How many ears of corn were left?	46 -14
2. There were 12 mice eating some corn. A cat caught and ate 6 of the mice. How many were left?	
3. Growing on the sides of the river were 68 little plants. A school of fish came by and ate 24 of the plants. How many were left?	
4. There were 38 little minnows in the school of fish. Six big fish swam by and gobbled up 22. How many little minnows were left?	
5. A pelican saw the 6 big fish. He dove down and ate 2 of them. How many fish were left?	

Name ______________________________


first
second
third
fourth
fifth
sixth
seventh
eighth
ninth
tenth

Follow the directions.

Put N on the third space.
Put O on the second space.
Put D on the fourth space.
Put P on the first space.

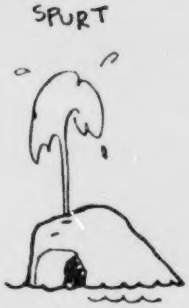
The habitat for a frog is a ____ ____ ____ ____
1 2 3 4

Put S on the fourth space.
Put N on the eighth space.
Put R on the second space.
Put D on the ninth space.
Put G on the first space.
Put A on the seventh space.
Put S on the fifth space.
Put L on the sixth space.
Put A on the third space.

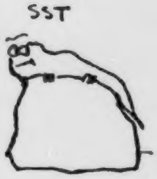
The habitat for a giraffe is the

____ ____ ____ ____ ____ ____ ____ ____ ____
1 2 3 4 5 6 7 8 9

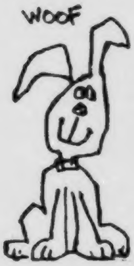
Name ____________________________



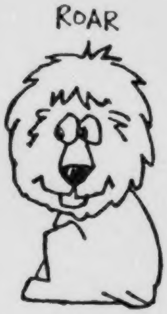
whale



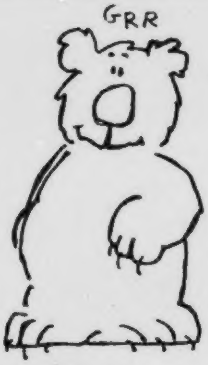
lizard



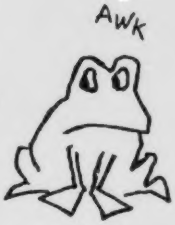
dog



lion



bear



toad

Directions:
Write the name of the correct animal on each space.

1. The fourth animal lives in the grasslands. That is its habitat.

   It is a ____________________.

2. The habitat for the fifth animal is the forest.

   It is a ____________________.

3. The second animal's habitat is the desert.

   It is a ____________________.

4. The habitat for the sixth animal is the pond.

   It is a ____________________.

5. The third animal is someone's pet. Its habitat is the city. The third animal is a ______________.

6. The first animal lives in the ocean. That is its habitat. It is a ____________________.

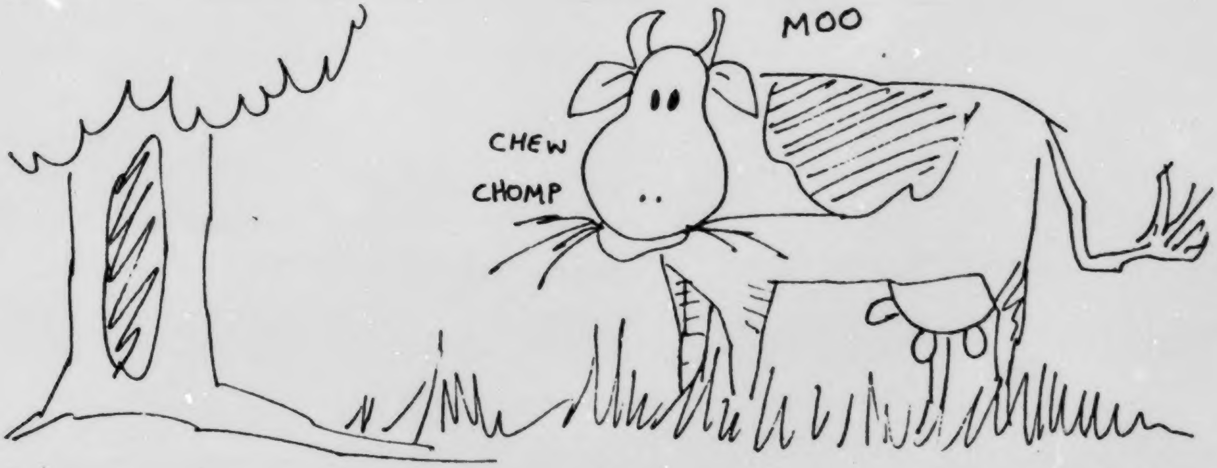
Name ______________________________

What do all food chains begin with?
Do the problems to find out.

3 4 + 2 = T	1 5 + 7 = P	2 8 + 1 = B	6 3 + 5 = N
2 1 + 9 = S	6 7 + 2 = W	9 1 + 6 = A	3 2 + 5 = L

Directions:
Write the letter of the answers that match.

All food chains begin with ___ ___ ___ ___ ___ ___
13 10 16 14 9 12



Name ______________________________

Directions:
Fill in the missing numbers.

1	2	3	N	5	6	7	8	9	10
A	12	13	14	15	S	17	18	19	20
21	R	23	24	25	26	27	28	29	D
31	32	33	34	35	36	O	38	39	40
W	42	43	44	I	46	47	48	T	E
51	52	53	54	55	56	57	L	59	60

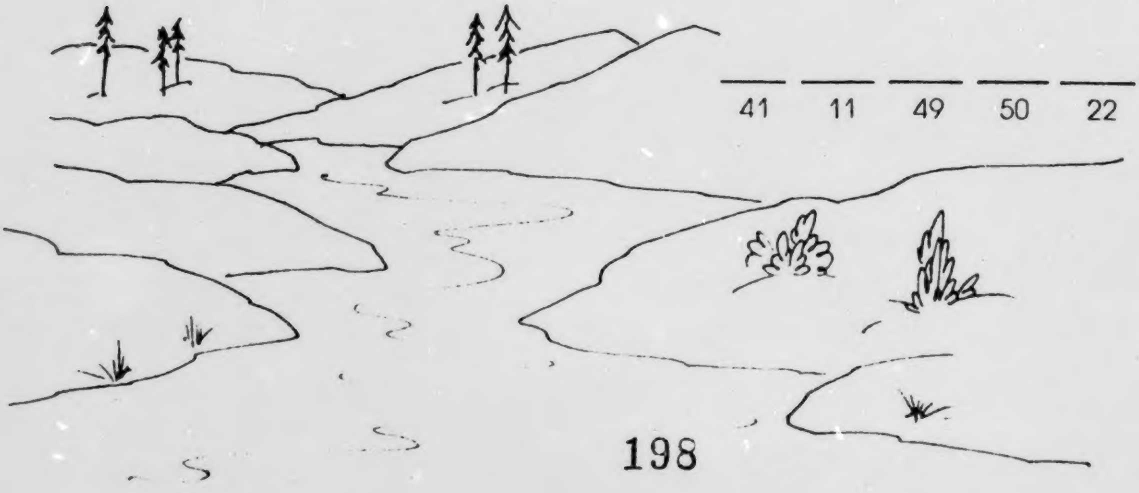
Answer the question below by filling in the spaces. Use the letters in the boxes that match the numbers under each space.

What are three of our natural resources?

____ ____ ____ ____,
16 37 45 58

____ ____ ____,
11 45 22

____ ____ ____
11 4 30



____ ____ ____ ____ ____,
41 11 49 50 22

Name ________________________________

The farm is a habitat for many animals. Chickens, ducks, cows, and pigs are often found on the farm.

Directions:

Write the number that comes just before:

4 = ______ = L
8 = ______ = N
31 = ______ = M
46 = ______ = C
60 = ______ = W
74 = ______ = U
98 = ______ = R

Write the number that comes just after:

4 = ______ = D
10 = ______ = I
19 = ______ = A
33 = ______ = S
52 = ______ = E
79 = ______ = K
88 = ______ = Q

Use your answers to solve the riddle. Match the numbered spaces to the numbers you wrote. Write the letter.

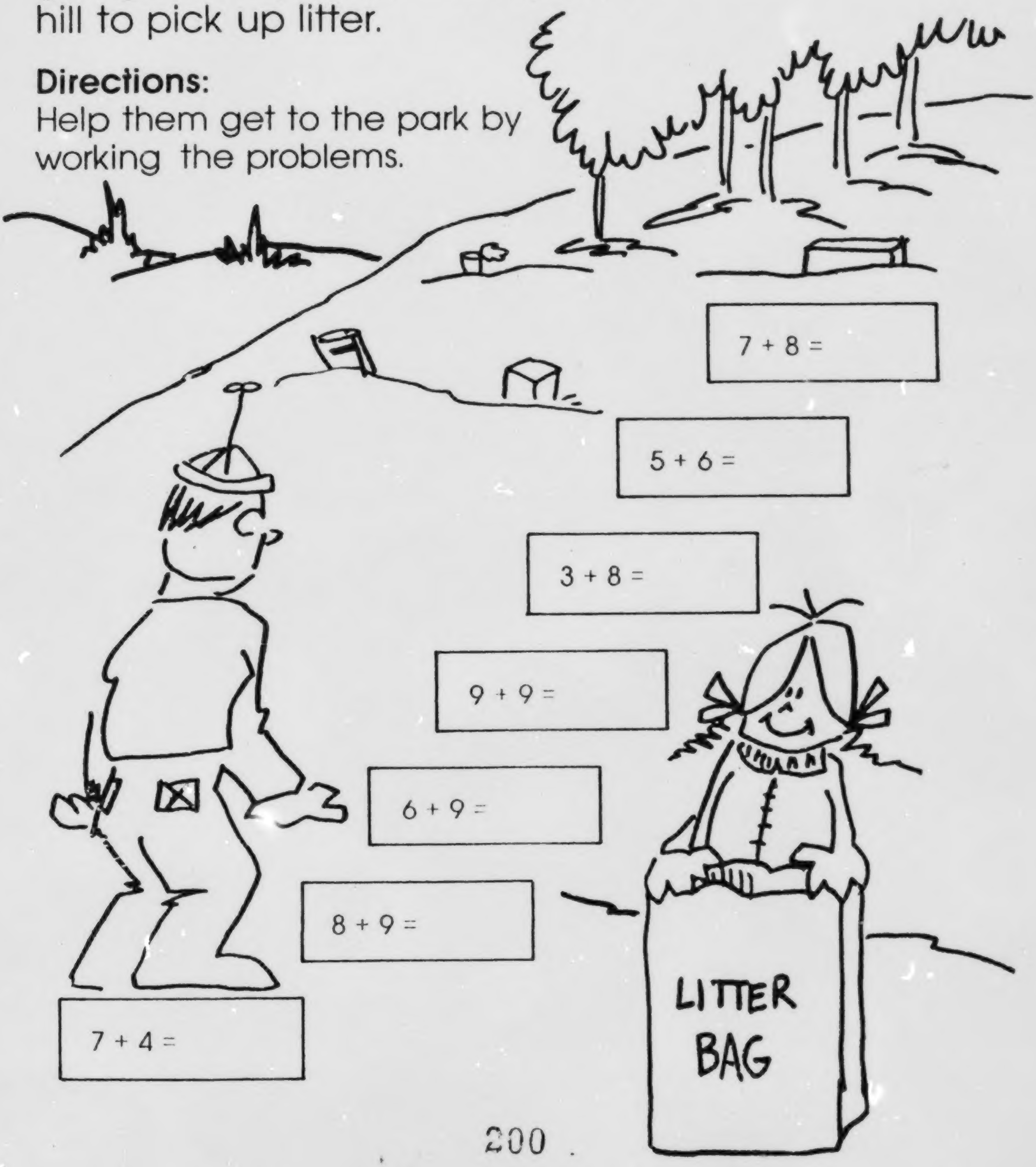
What does a farmer have if he owns a cow and a duck?

____	____	____	____	____	____	____	
30	11	3	80	20	7	5	
____	____	____	____	____	____	____	____
89	73	20	45	80	53	97	34

Name ________________________________

Johnny and Susie want to help keep their environment clean. They are going to the park at the top of the hill to pick up litter.

Directions:
Help them get to the park by working the problems.



7 + 8 =

5 + 6 =

3 + 8 =

9 + 9 =

6 + 9 =

8 + 9 =

7 + 4 =

Name ______________________________

Directions:
Circle the correct number that completes the number sentence.
Write the letter that is under the correct number on the blank spaces.

4 + 5 = ____	3 + ____ = 12	____ + 7 = 9	1 + ____ = 10
8 9 7	9 4 8	4 1 2	8 2 9
P S T	A B O	W M N	L R D

Glass is made from ___ ___ ___ ___.

6 + ____ = 11	2 + ____ = 10	____ + 6 = 9
3 5 4	8 7 9	2 4 3
B O T	I A R	T O L

Plastic is made from ___ ___ ___.

8 + ____ = 15	____ + 4 = 10	____ + 2 = 9	3 + 3 = ____
9 2 7	3 6 1	7 4 6	2 5 6
P X W	G O L	O R J	A S D

Paper is made from ___ ___ ___ ___.

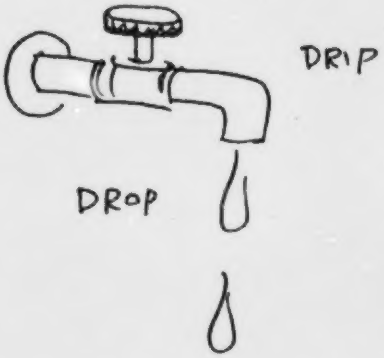
Name ____________________

Directions:
Write the number that means the same as the numbers in the boxes.

100 + 30 + 7 = 137 = T

100 + 60 + 2 = ______ = A

30 + 9 = ______ = E



400 + 50 + 1 = ______ = W

200 + 90 + 0 = ______ = S

600 + 10 + 3 = ______ = V

80 + 8 = ______ = R

700 + 10 + 4 = ______ = P

10 + 5 = ______ = B

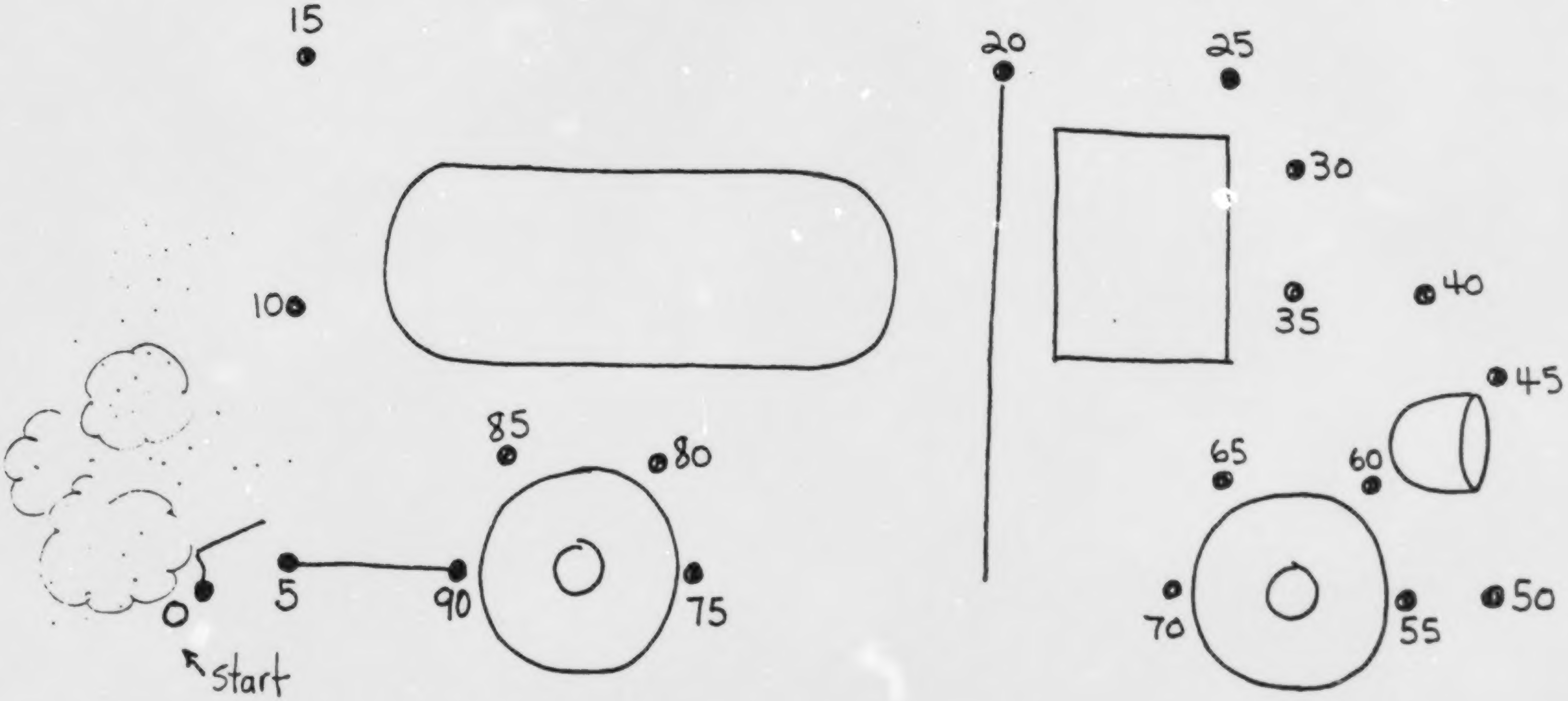
Use your answers to complete the sentence.

These are ways we can

____ ____ ____ ____   ____ ____ ____ ____ ____
290 162 613 39   451 162 137 39 88

Name

Directions:
Follow the dots.
Count by 5 s.
Start with 0.


15
20
25
30
10
35
40
45
85
80
65
60
5
90
75
70
55
50
0
Start

This can cause air pollution.

Name ______________________________

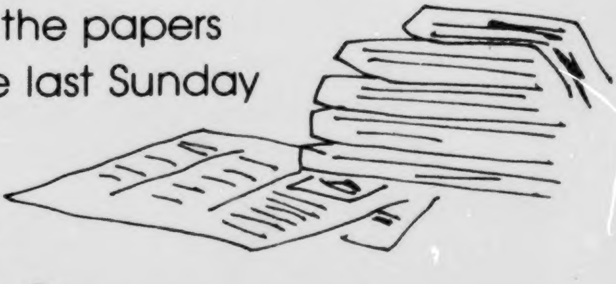
Directions:
Fill in the missing numbers on the calendar.

1980 **JULY** **1980**

Sun.	**Mon.**	**Tues.**	**Wed.**	**Thurs.**	**Fri.**	**Sat.**
		1	2		4	5
6	7	8		10	11	
13			16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Use the calendar to answer the questions.

1. John is going to collect newspapers on July 9th.
   What day of the week is that? ______________________
2. He is going to tie his papers together on July 14th.
   What day of the week is that? ______________________
3. On July 19th he is going to take them to the
   recycling center. What day is that? ________________
4. The recycling center takes all the papers
   to the paper company on the last Sunday
   of July. Write the date.

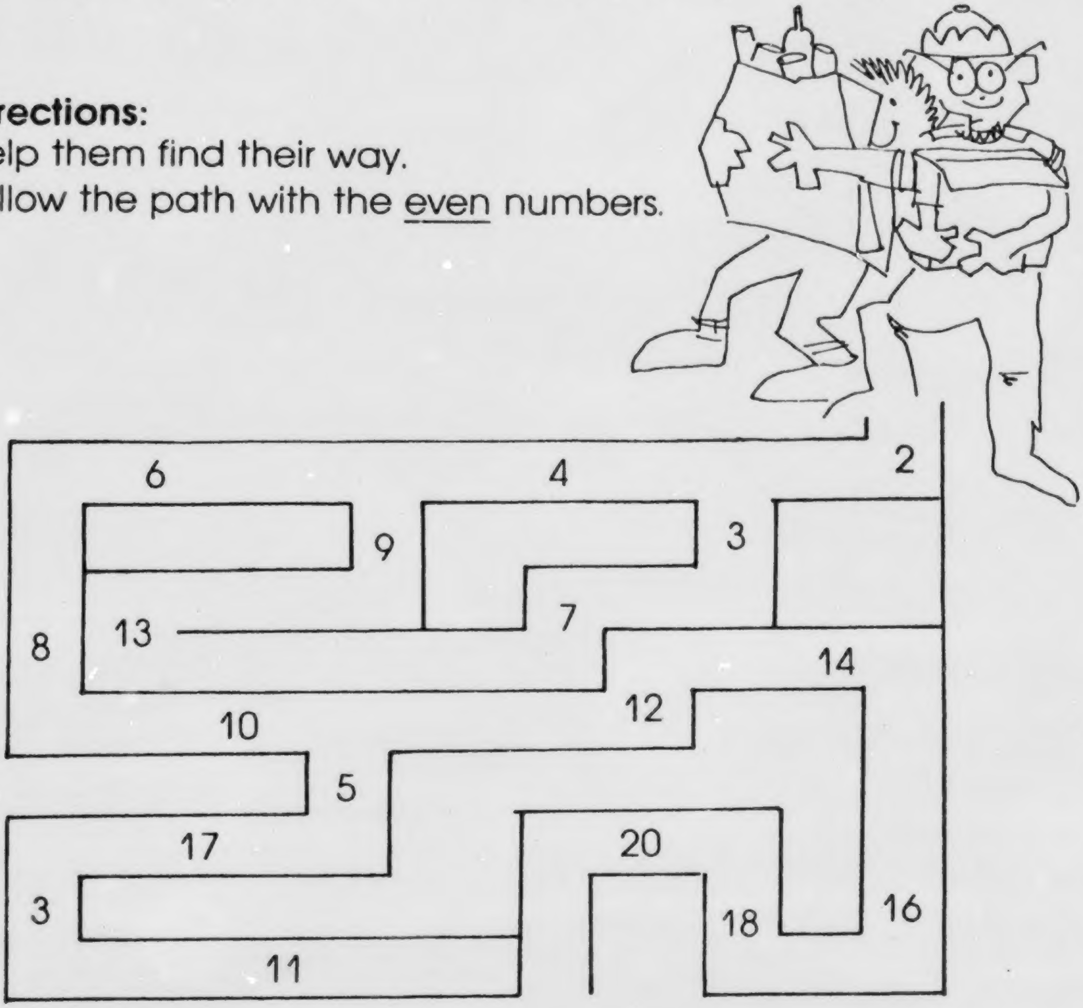


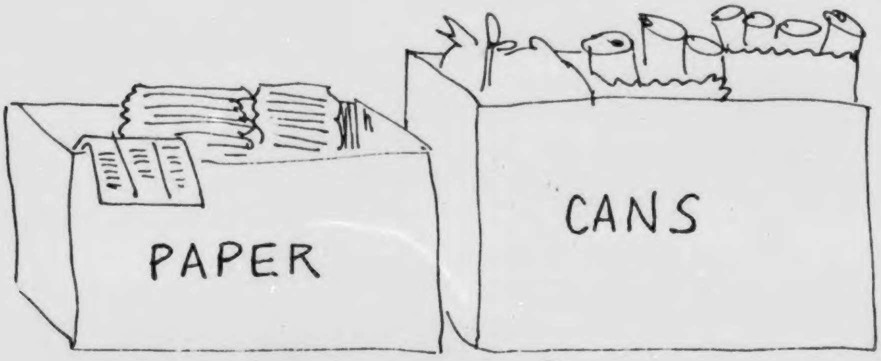
____

Name ______________________________

Joe and Betty are helping to save our natural resources. They are taking used cans, paper and glass to the recycling center.

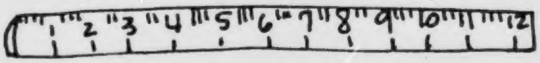
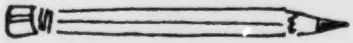
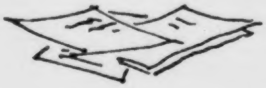
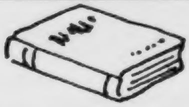
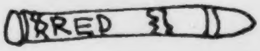
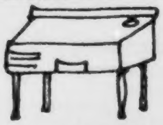
Directions:
Help them find their way.
Follow the path with the even numbers.


6
4
2
9
3
13
7
8
14
12
10
5
17
20
3
18
16
11



Name

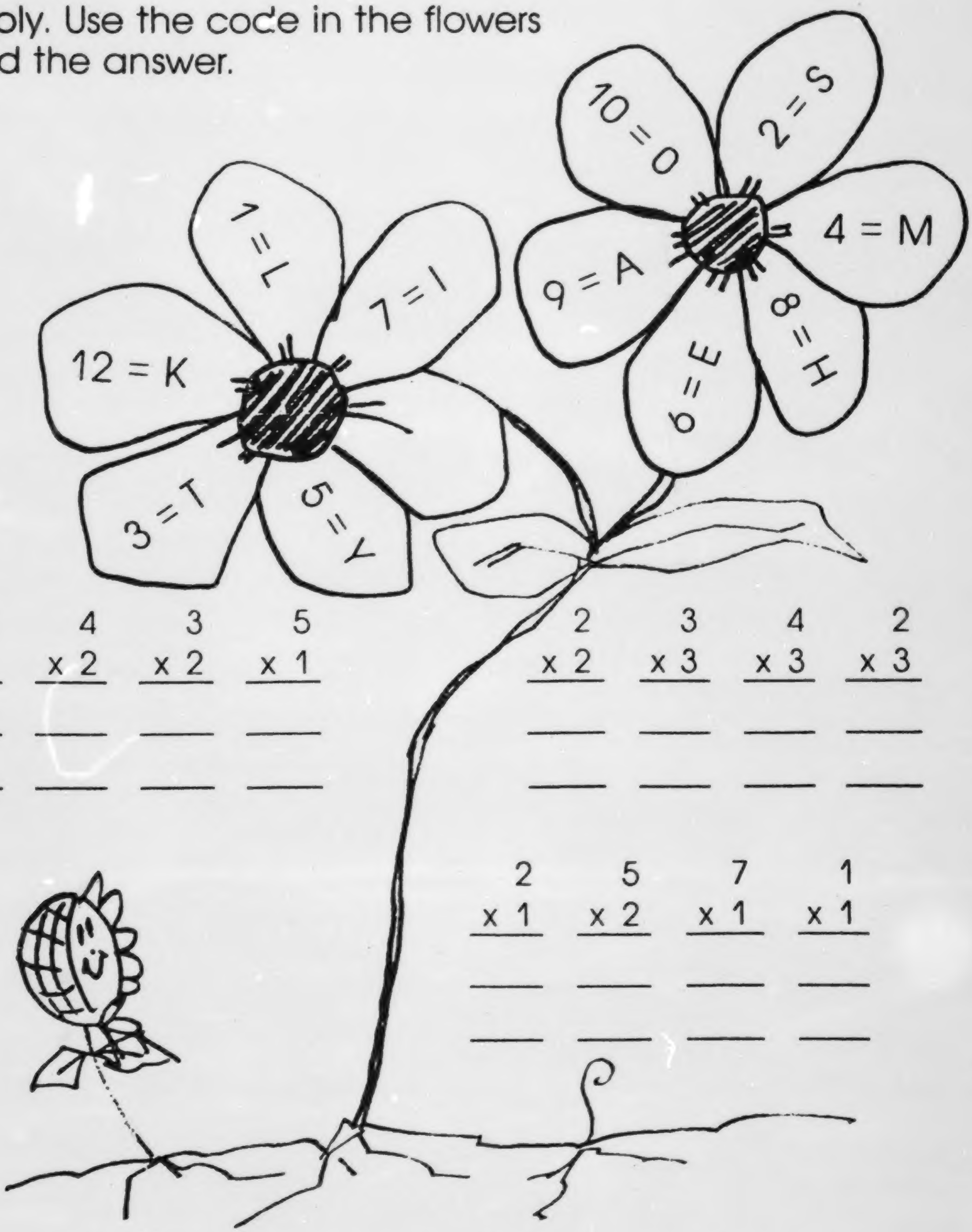
Directions:
Do the problems.
Color all the things that are made from trees.

1. Bobby had 2 s He lost 1 ruler. How many does he have left?	2 - 1
2. John had 3  s Mary gave him 2 more pencils. How many does he have now?	
3. Susan had 6 pieces of . She used 3 of the papers. How many does she have left?	
4. Timmy had 5  s. He took 1 of the books back to the library. How many does he have left?	
5. Sally had 4  s. A friend gave her 2 more crayons. How many does she have in all?	
6. There were 7  s in the room. Mr. Jones brought in 2 more desks. How many desks are there in the room now?	

Name ______________________________

How do animals help plants?

Directions:
Multiply. Use the code in the flowers to find the answer.


1 = L
7 = I
12 = K
3 = T
5 = Y
10 = O
2 = S
4 = M
9 = A
6 = E
8 = H

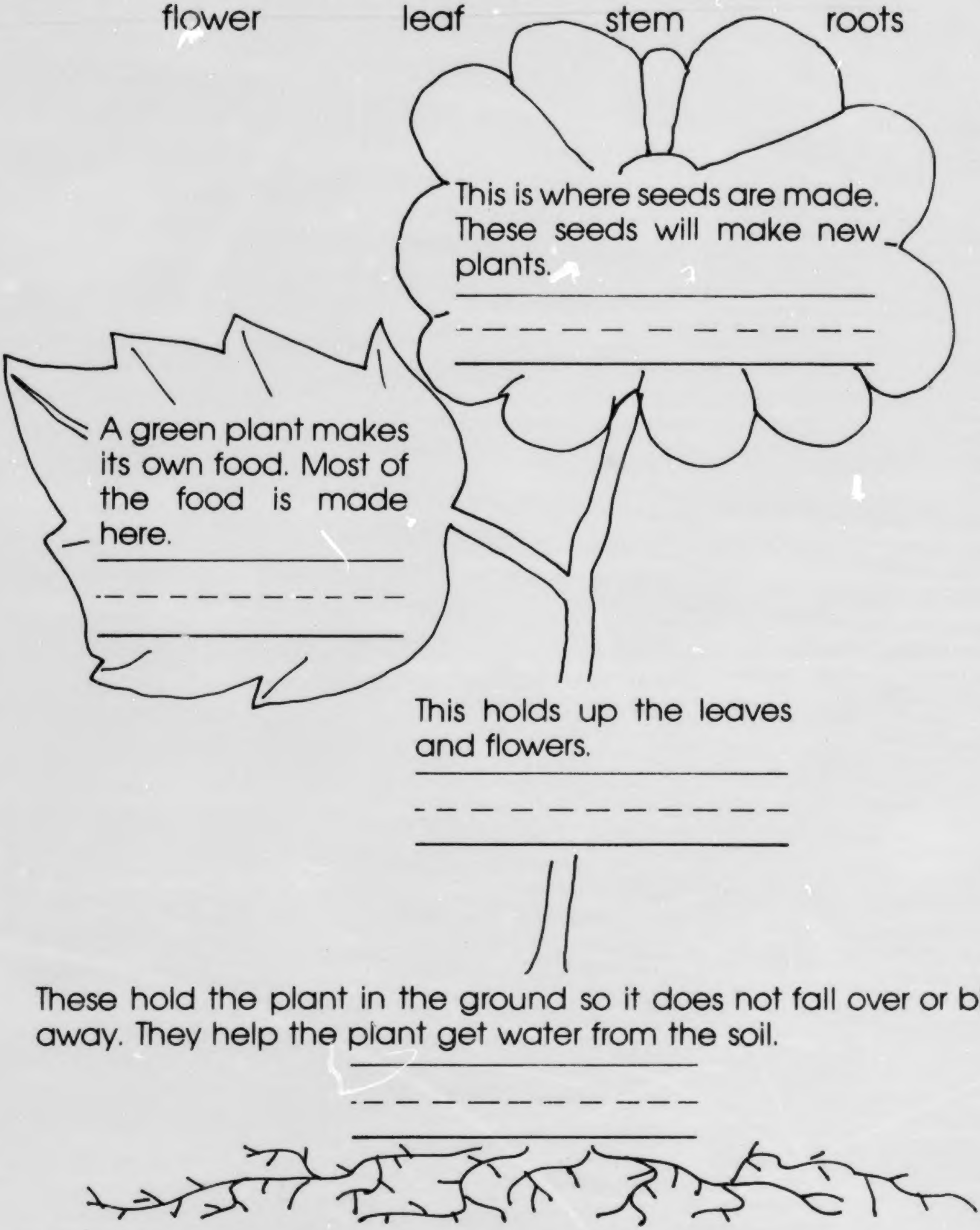
3	4	3	5	2	3	4	2
x 1	x 2	x 2	x 1	x 2	x 3	x 3	x 3
3							
T							

2	5	7	1
x 1	x 2	x 1	x 1

Name

Directions: Use these words to write the names of the parts of a plant.

flower leaf stem roots



This is where seeds are made. These seeds will make new plants.

A green plant makes its own food. Most of the food is made here.

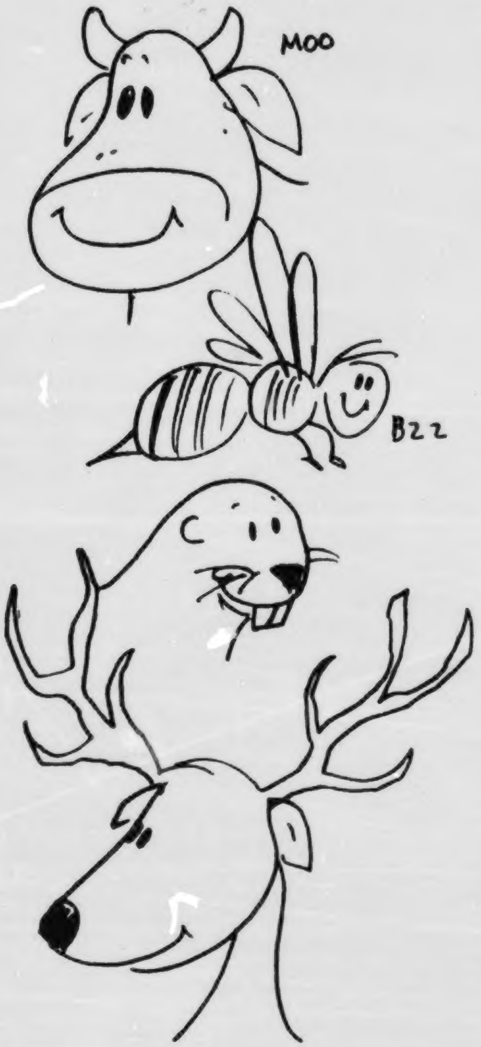
This holds up the leaves and flowers.

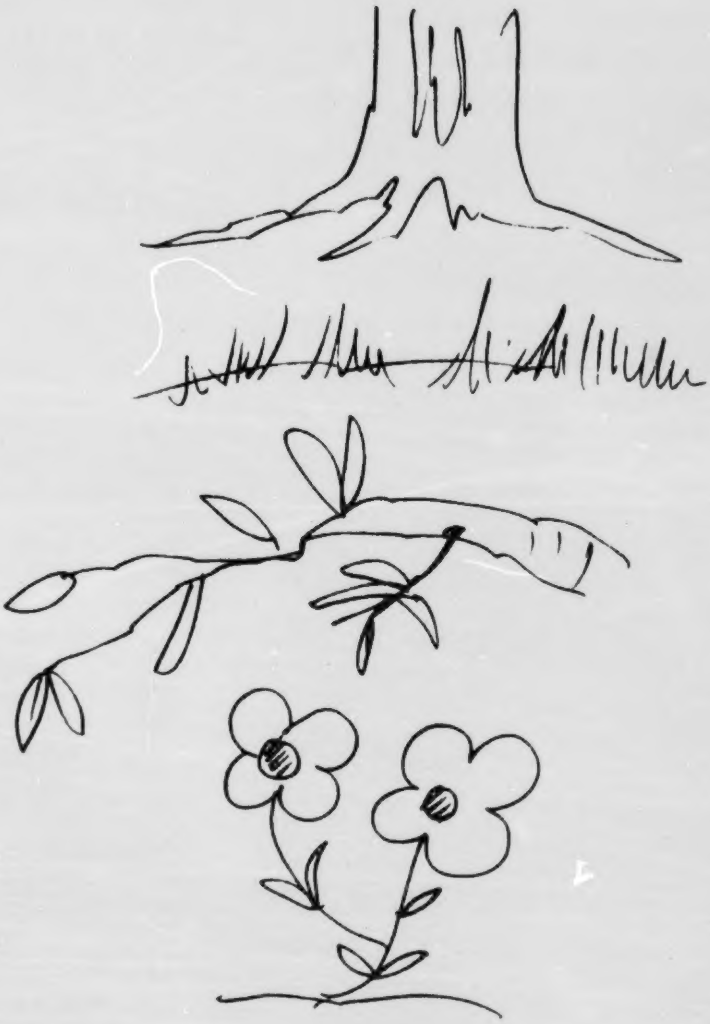
These hold the plant in the ground so it does not fall over or blow away. They help the plant get water from the soil.

Name

All animals need food to grow.
Some animals eat only plants.
They eat leaves, grass, tree bark, fruit,
nuts, seeds and parts of flowers.

Directions: Draw a line from the animal to the part of the plant that he might eat for dinner.



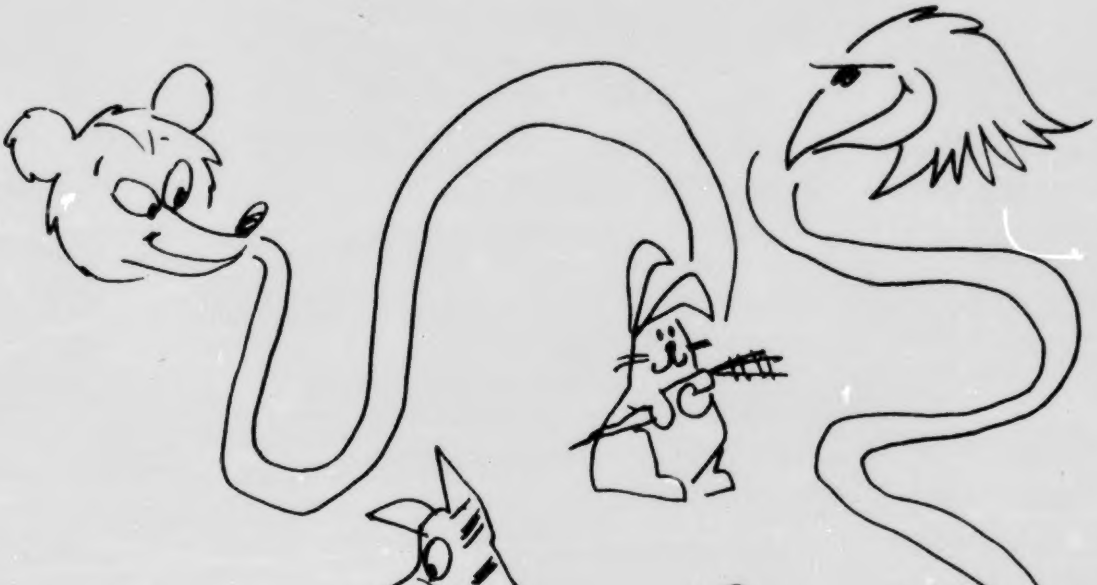


What would happen to these animals if there were no plants?

Name ______________________

Some animals eat only meat.
Animals that eat meat have to hunt and catch their food.

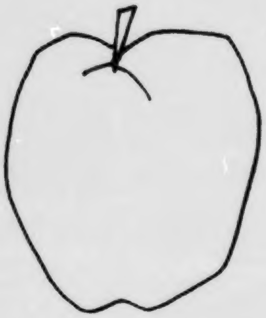
Directions: Follow the trail for each animal to see what he will have for dinner.

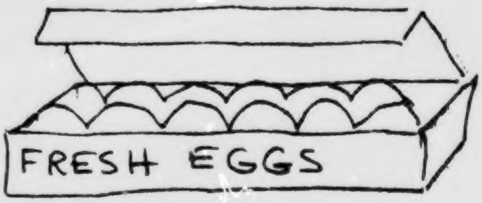


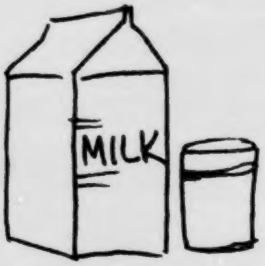
Name

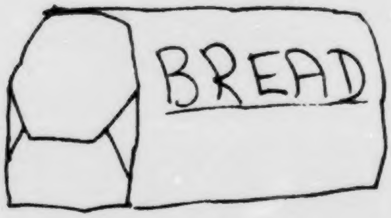
Some animals eat both plants and other animals. People are animals that eat plants and other animals.

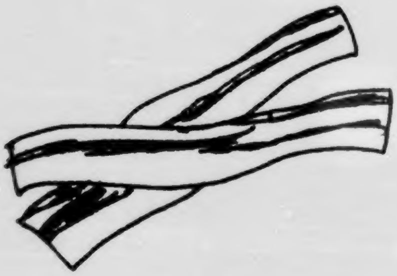
Directions: If the food comes from plants, write plant.
If the food comes from an animal that eats plants, write animal.

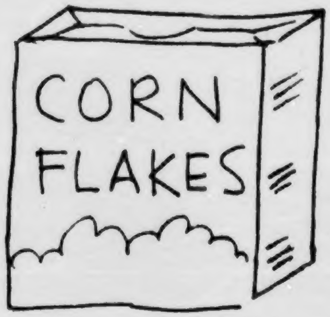










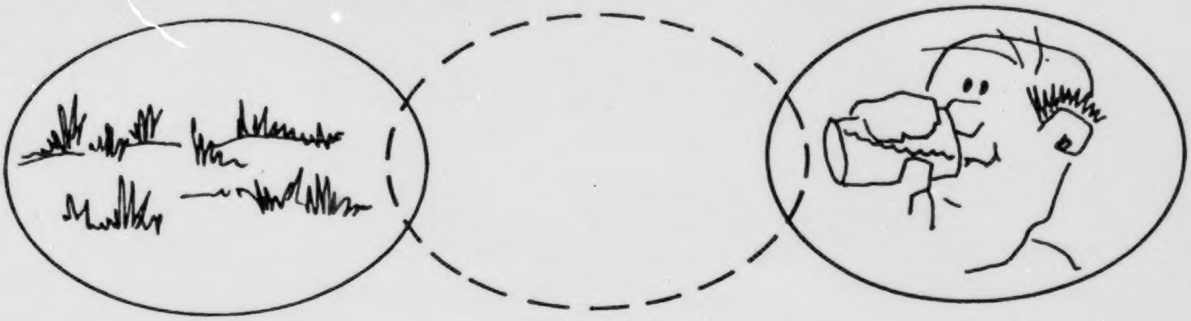

CORN
FLAKES

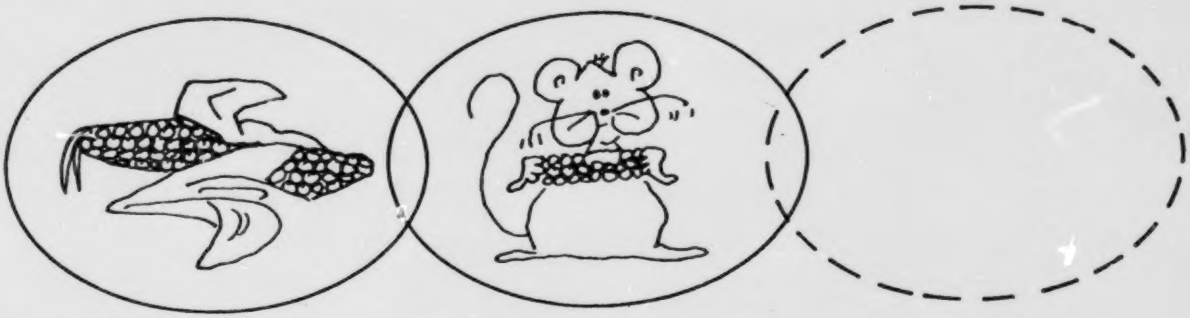
Name

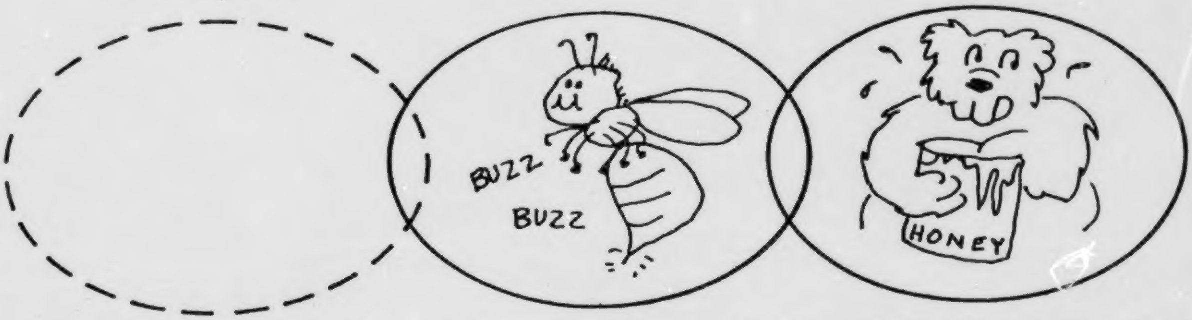
Food Chains

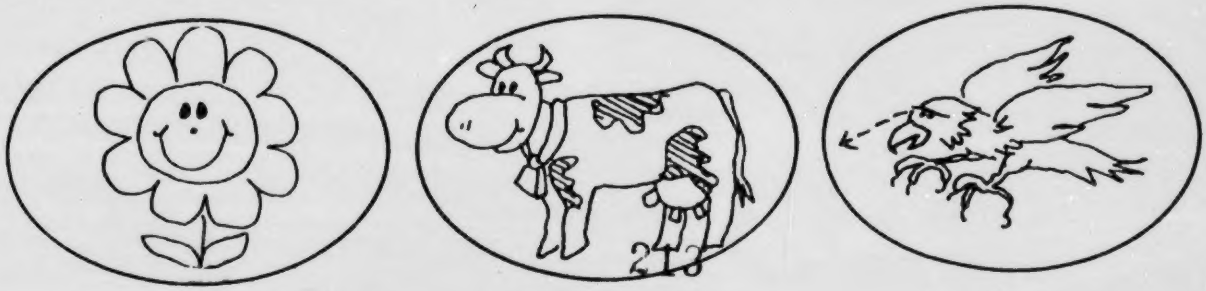
There are all kinds of food chains, but they all begin with plants.

Cut out the 'links' at the bottom of the page. Paste them in the correct places in the food chains below.









Animals and plants need each other.
Plants give animals food, clothes, wood for houses, and many other things.
Animals help plants too.
Here are some things animals do for plants.

Directions:
Cut out the sentence blocks and paste them next to the correct pictures.

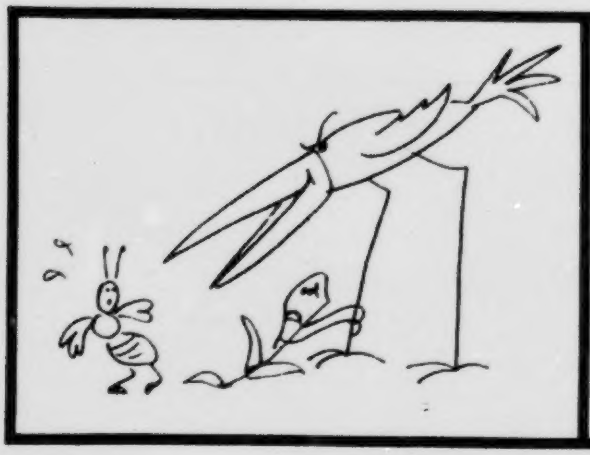
People take care of plants.

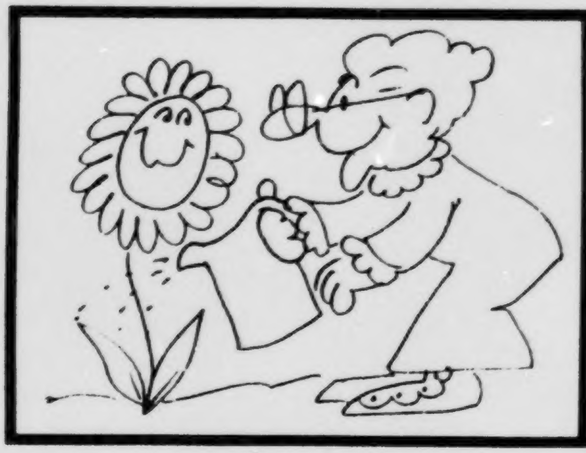
Birds eat insects that can hurt plants.

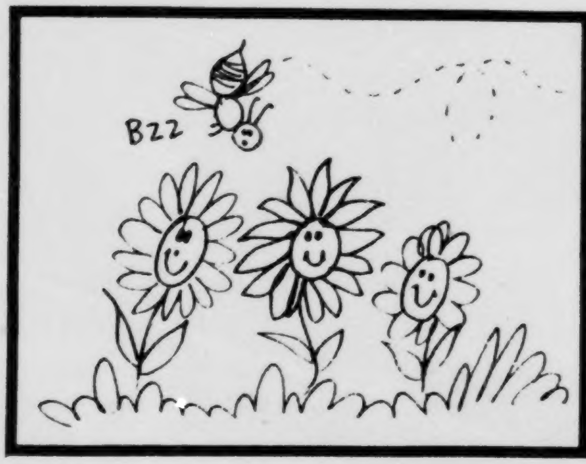
Small animals and insects spread pollen to make more plants grow.

Name

Animals help plants.







Name

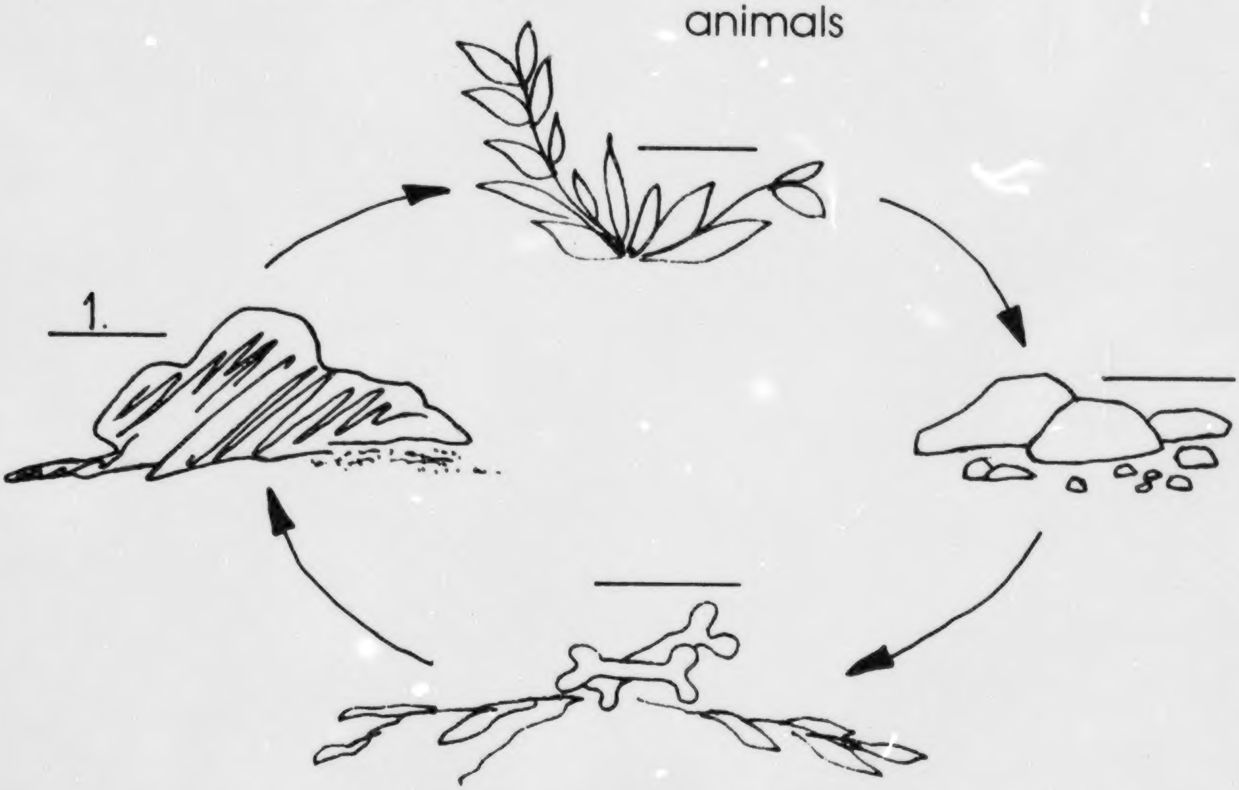
Soil is one of our natural resources.
Read the story to find out where soil comes from.

The Earth has many rocks. Sun, wind, and water break up and wear away rocks. Growing plants may break rocks too. Small bits of broken rocks become soil.

Dead plants and animals help make soil too. When plants and animals die in the soil, they become part of the soil. The dead plants and animals help new plants to grow. This is nature's way of recycling.

Directions: Put the numerals on the part of the picture that shows how soil is made.

1. soil
2. new plants
3. broken rocks
4. dead plants and animals



Name ________________________

How do plants help soil?

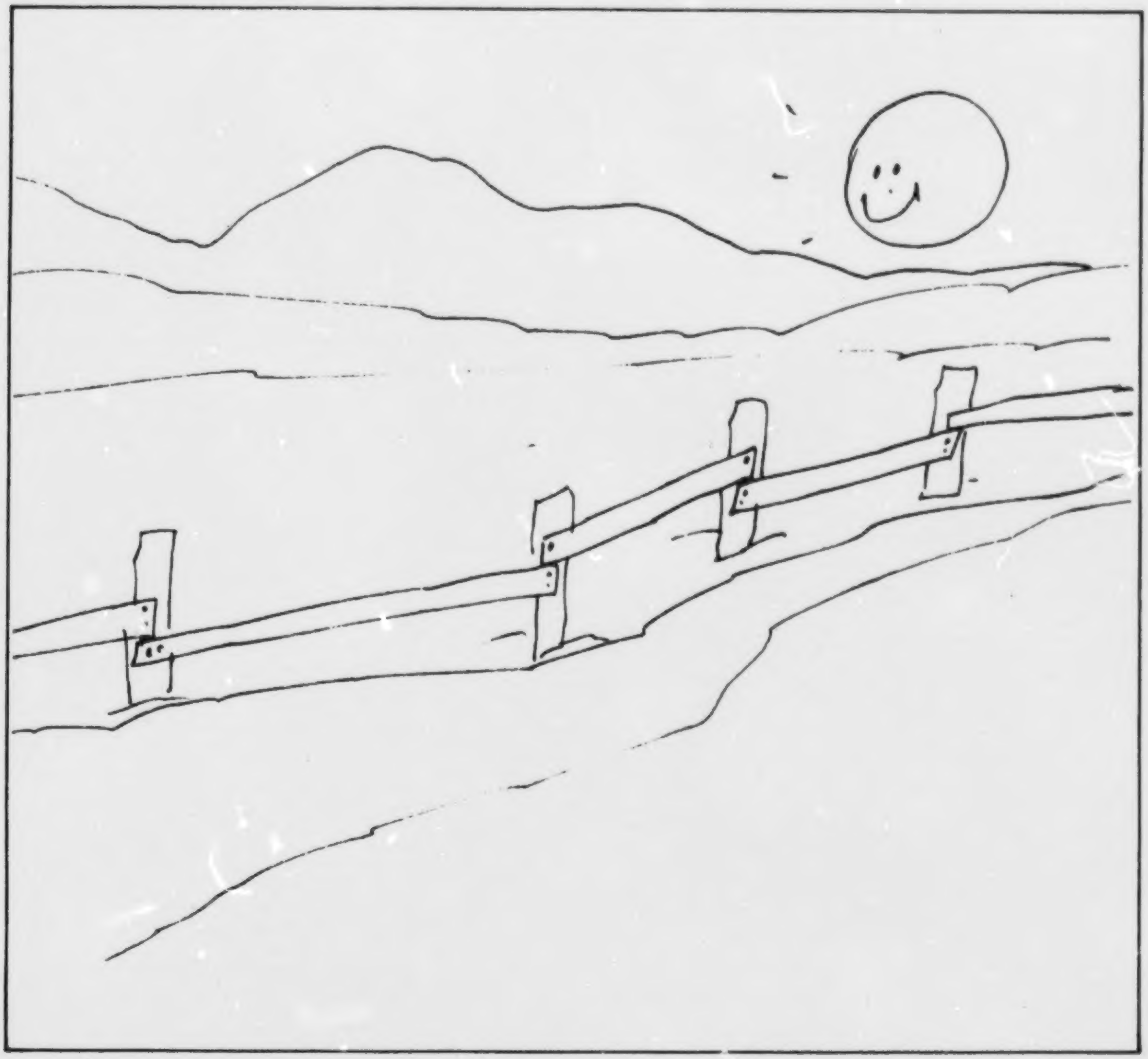
Grass and other plants hold soil together.

Plant roots grow under the ground. They hold the soil in place.

Roots keep the wind from blowing the soil away.

Roots keep water from washing the soil away.

Directions: Help save the soil in the picture by drawing trees, bushes, and other plants.



Name

Each plant and animal has things that help it live.

Directions: Use the code to find out what these plants and animals have that helps them to live.

CODE

A 1	B 2	C 3	D 4	E 5	F 6	G 7	H 8	I 9	J 10	K 11	L 12	M 13
N 14	O 15	P 16	Q 17	R 18	S 19	T 20	U 21	V 22	W 23	X 24	Y 25	Z 26

A polar bear lives in a cold place.

9 20 19 20 8 9 3 11

6 21 18 11 5 5 16 19

9 20 23 1 18 13.

A cactus plant lives in a dry place.

9 20 19 12 5 1 22 5 19

1 14 4 19 20 5 13 19

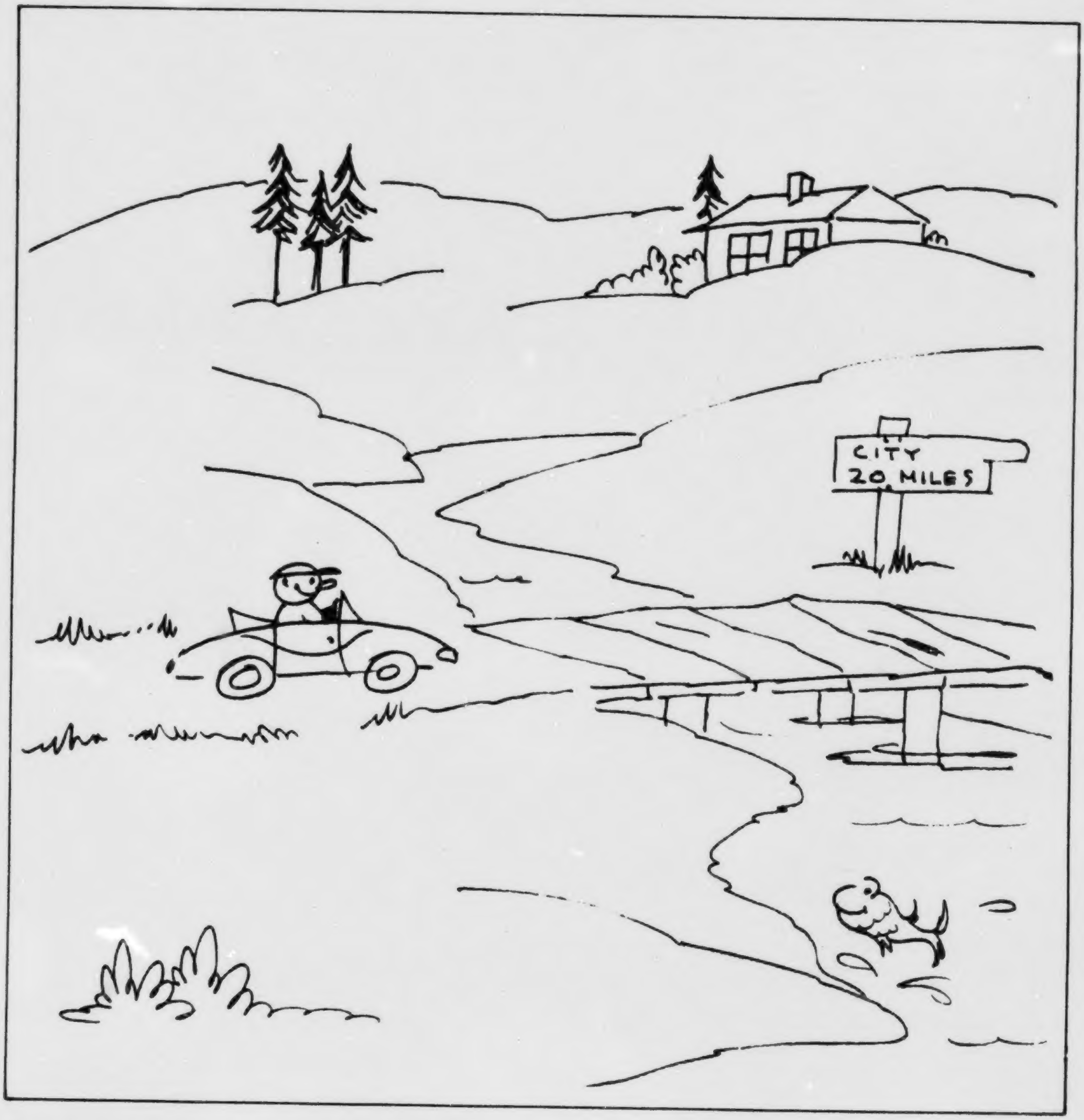
8 15 12 4 5 24 20 18 1

23 1 20 5 18.

Name ______________________

People live on the Earth with plants and other animals. But, people can change the Earth more than other animals can. They have hands that can build things.

Directions: Color all the things that were built by people.

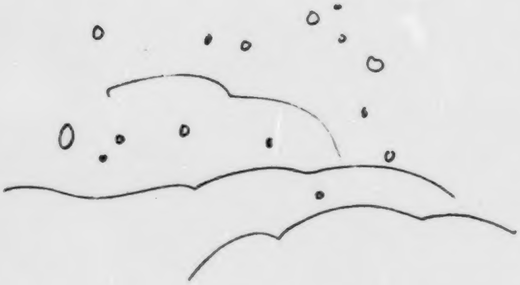


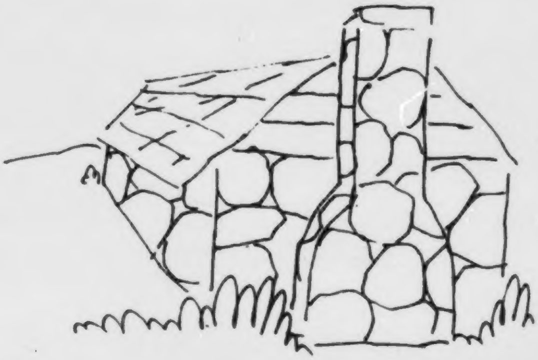
People must keep the Earth a good place for all living things.

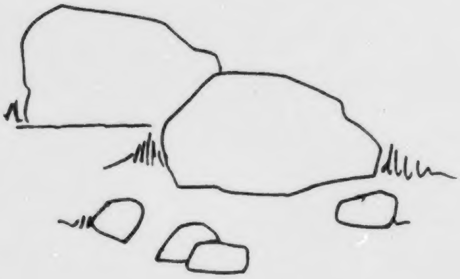
Name ______________________________

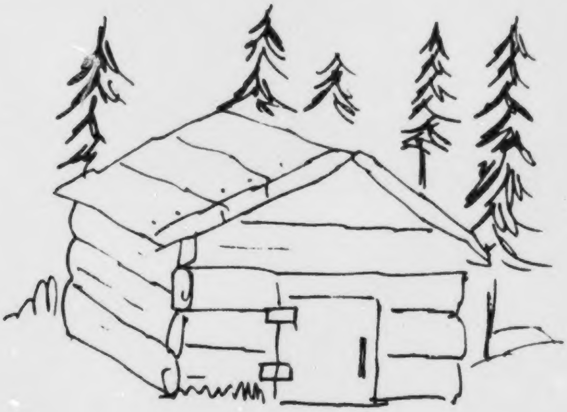
People often build houses using the natural resources that are found where they live.

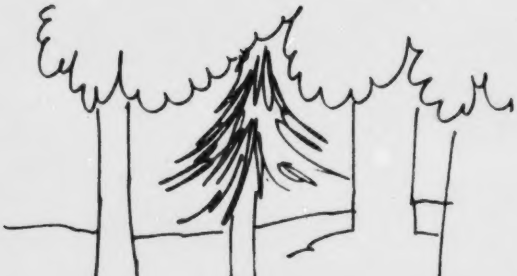
Directions: Draw a line from the house to the natural resource it is made from. Color the pictures.

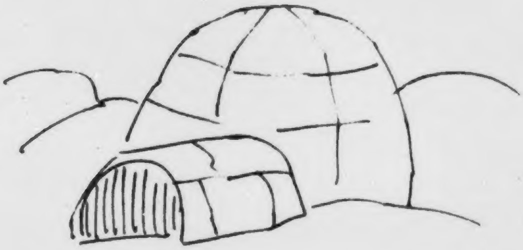












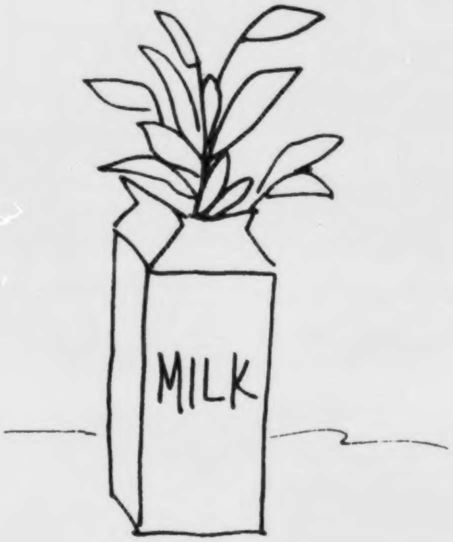
Name ______________________________

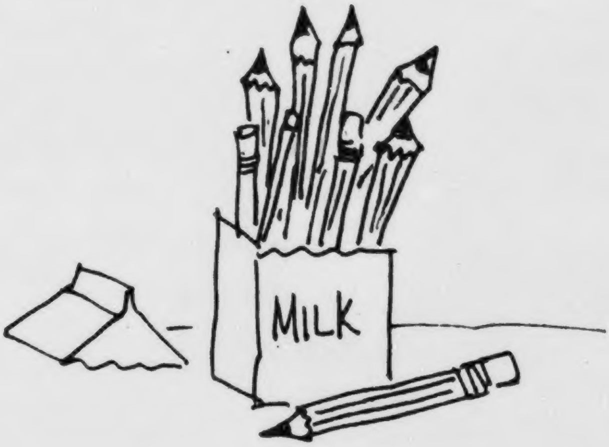
____

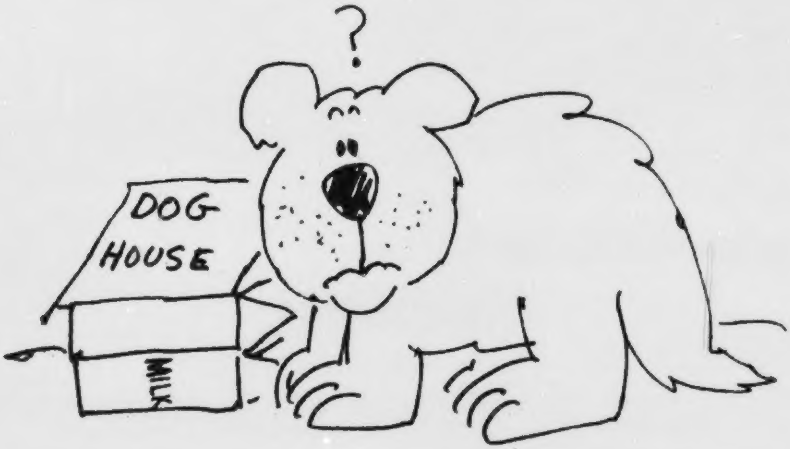
Recycling saves our natural resources. It is a way of using things and materials over again. When we recycle things, we don't need to use more of our natural resources.

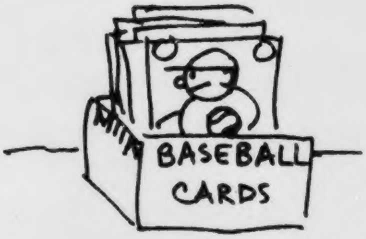
Carole is drinking milk for lunch. The milk comes in a carton that is made from paper which comes from wood. She wants to recycle the milk carton.

Directions: Color the pictures that show ways Carole could recycle the milk carton.



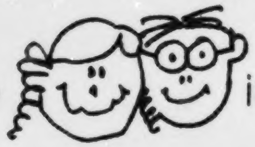
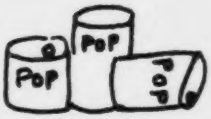
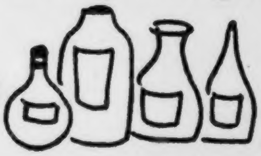
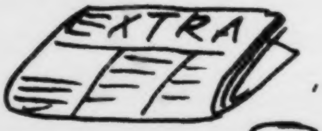


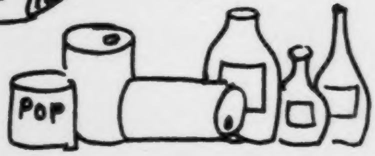
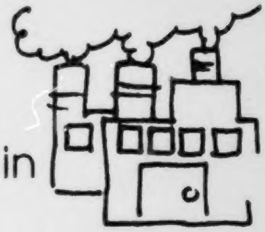
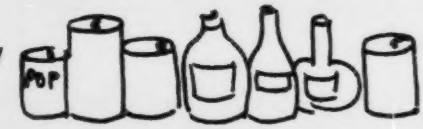

?
DOG HOUSE
MILK

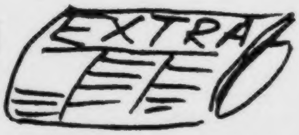
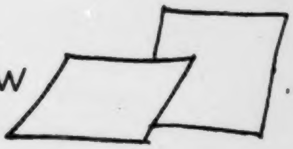

MILK
BASEBALL CARDS

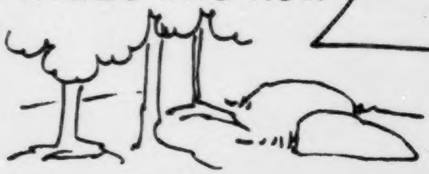
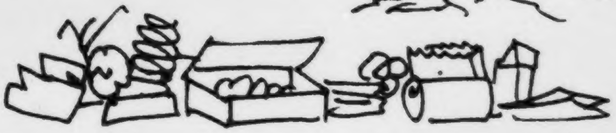
Name

Directions: Use the pictures to read the story.

The  in Miss Simmons' class are saving things to be recycled. They are saving  and  and , too.

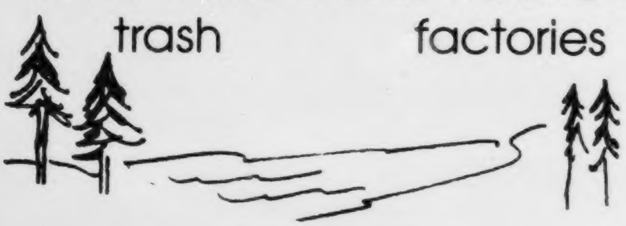
The used  can be melted in  to make new .

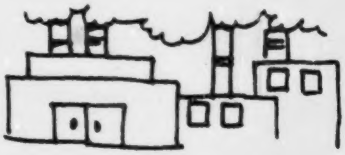
Old  can be made into new .

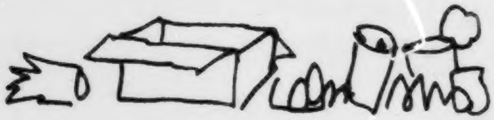
This will help to save our  and we will have less .

Write these words next to the pictures:

trash factories natural resource







Name ______________________________

Here are some ways you can help to save our natural resources.

Directions: Write yes in front of the ways that will help.
Write no in front of the ways that will not help.

SAVE OUR RESOURCES
SAVE
WOOF

WAYS TO SAVE OUR NATURAL RESOURCES

________ Use both sides of writing papers.

________ Always use paper cups and plates.

________ Turn off lights you are not using.

________ Throw books away after you have read them.

________ Turn off water you are not using.

________ Recycle as many things as you can.

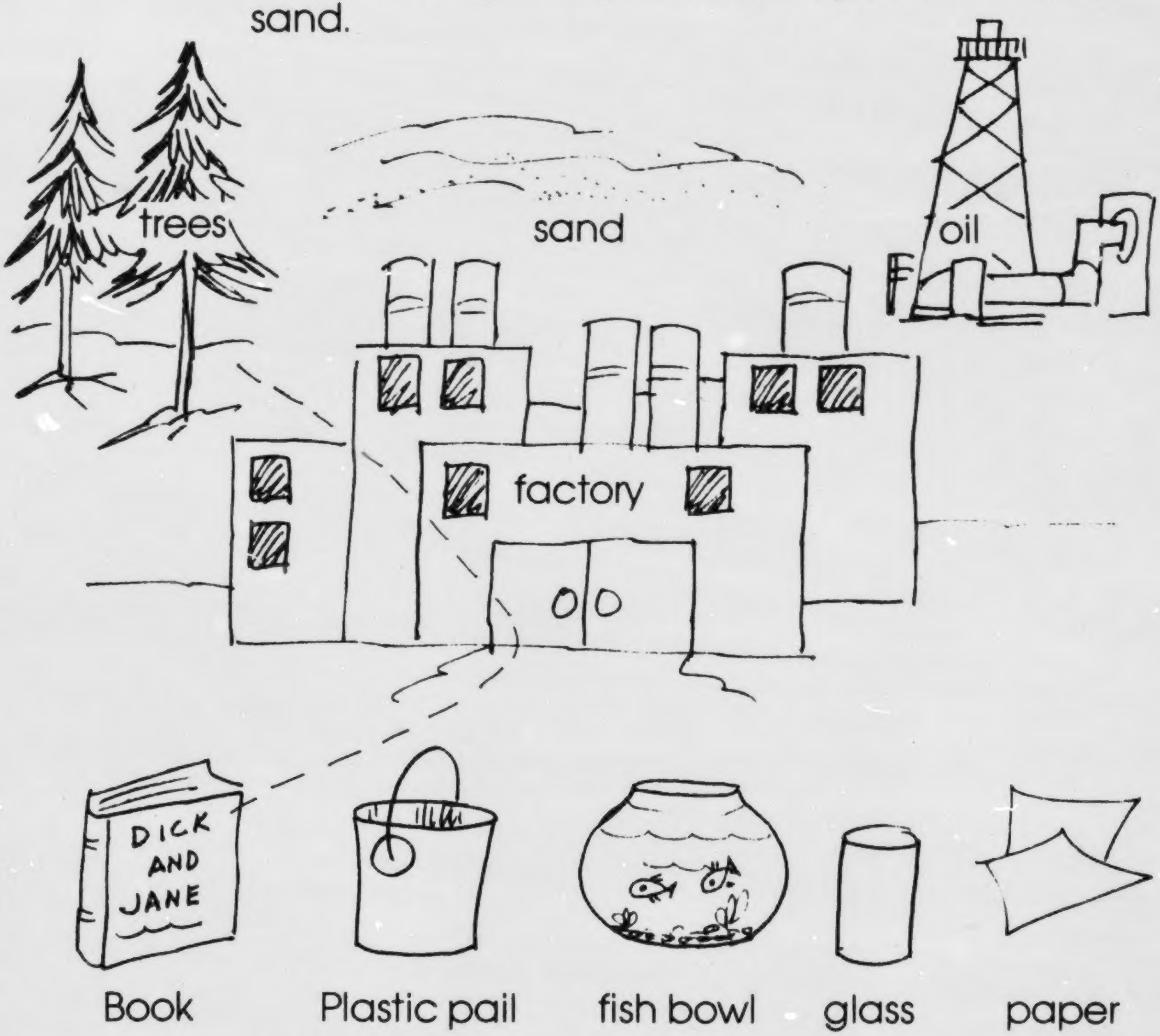
Name ______________________________

We get many things from our natural resources. Some of these things are made in factories.

Directions: Draw a line from the things we use back to the natural resource that it comes from. Be sure to go through the factory.

Use a black crayon if the object is made from oil. Use a green crayon if the object is made from wood.

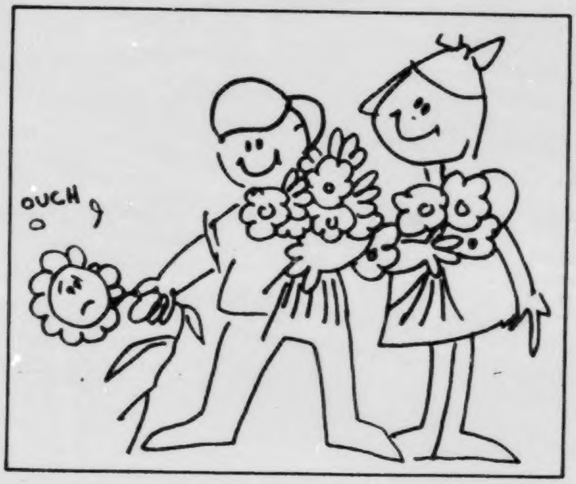
Use an orange crayon if the object is made from sand.


trees
sand
oil
factory
DICK AND JANE
Book
Plastic pail
fish bowl
glass
paper

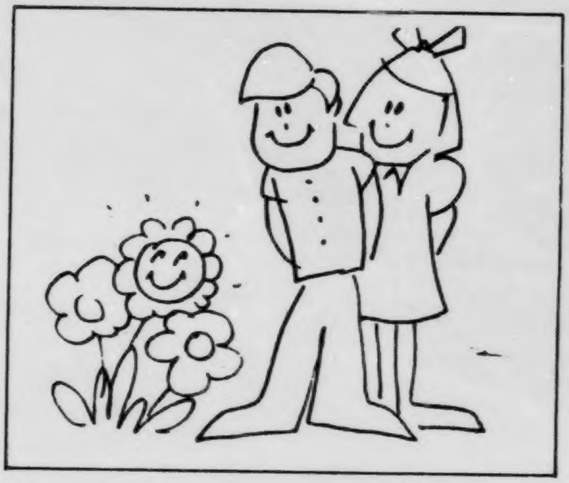
Name

Directions: Choose an ending for each story. Color it.

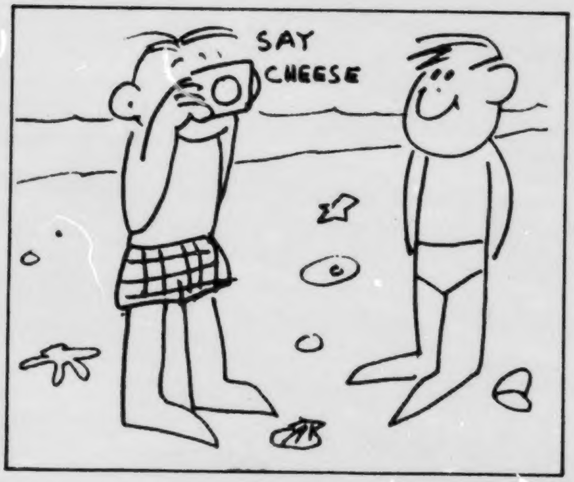
Mary and Jim went for a walk in the forest. There were many pretty flowers growing by the path.



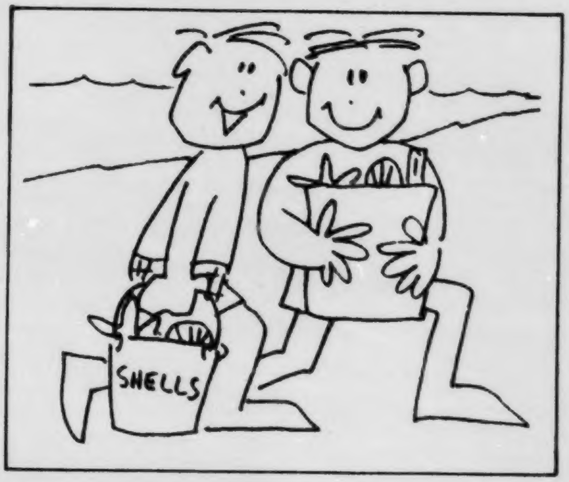
or



Matt and Mike went to the beach. They saw many shells, starfish and other little animals.

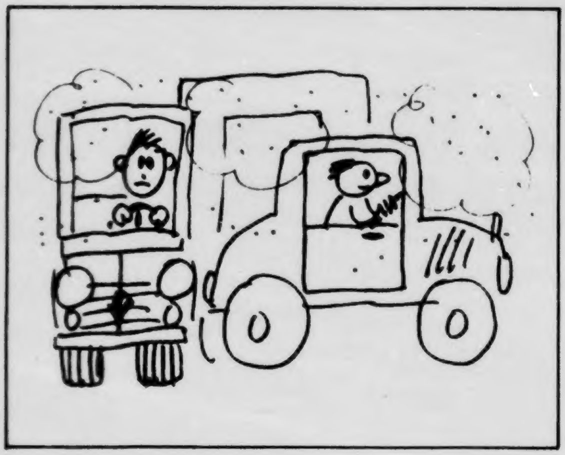


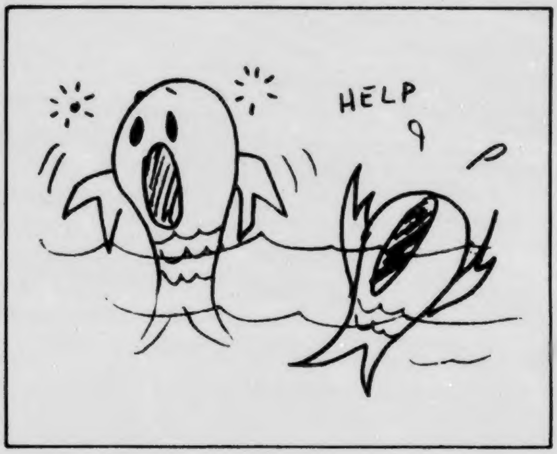
or

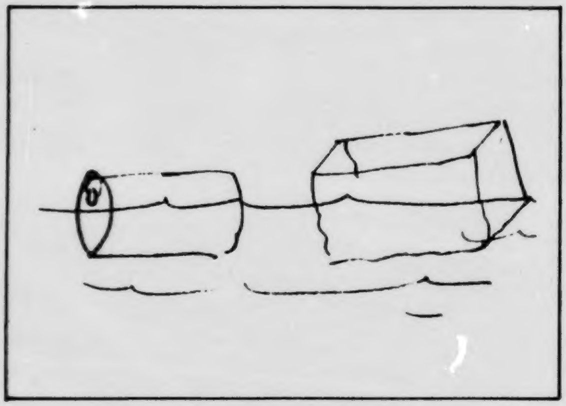


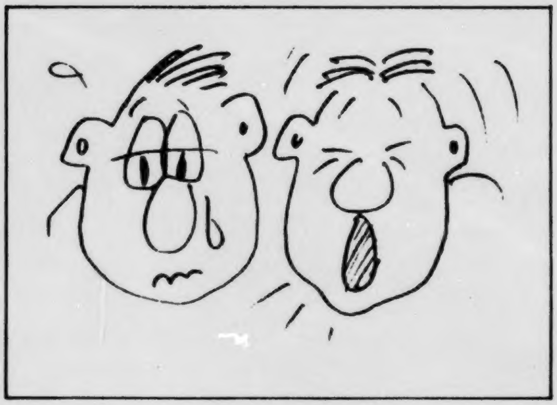
Name ________________________________

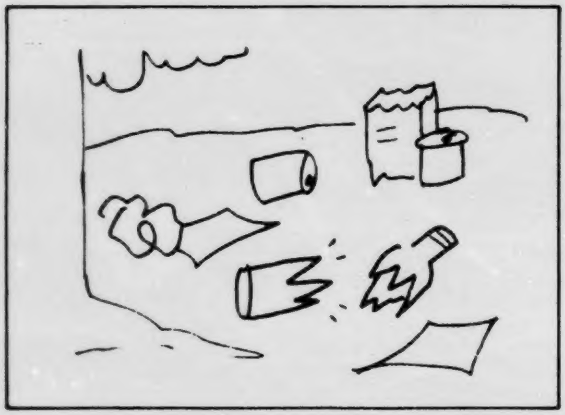
Directions: Draw a line from each picture to the one that shows what could happen next.

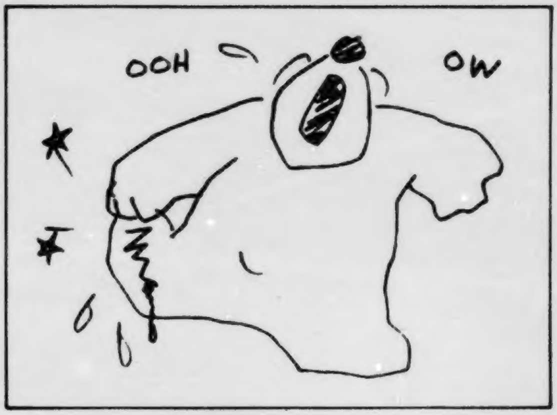








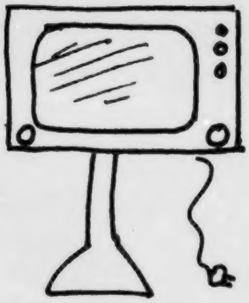




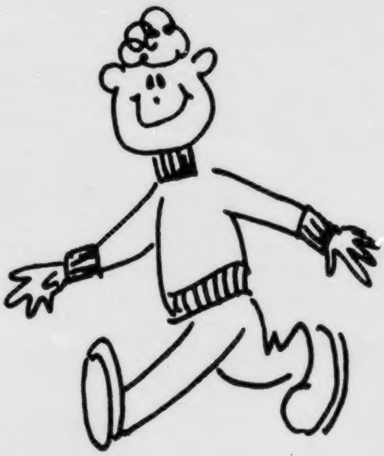
Name

Conservation: to save from waste or loss of resources.

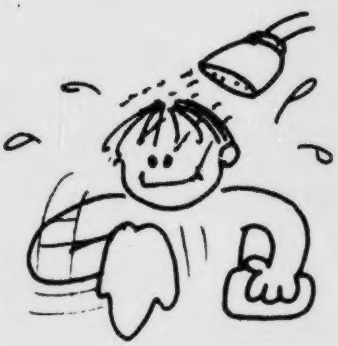
Here are ways to conserve our natural resources.
Put an "X" on the things you do.



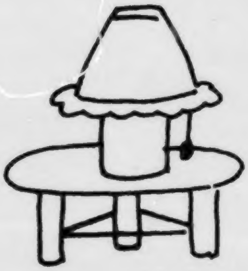
Turn off TV when not watching



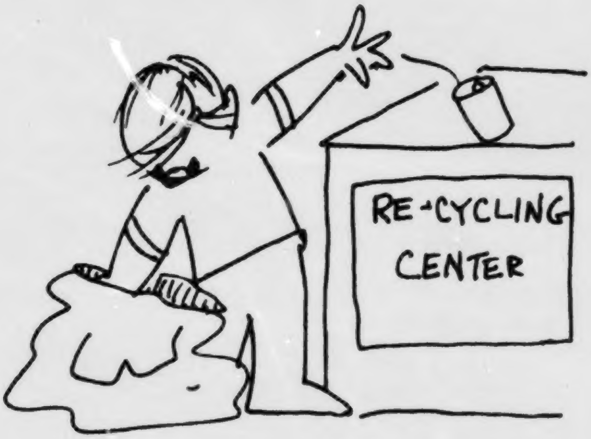
Walk when you can



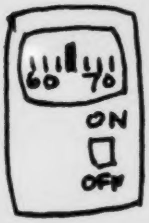
Hurry in the shower



Turn off lights


RE-CYCLING
CENTER

Use things again

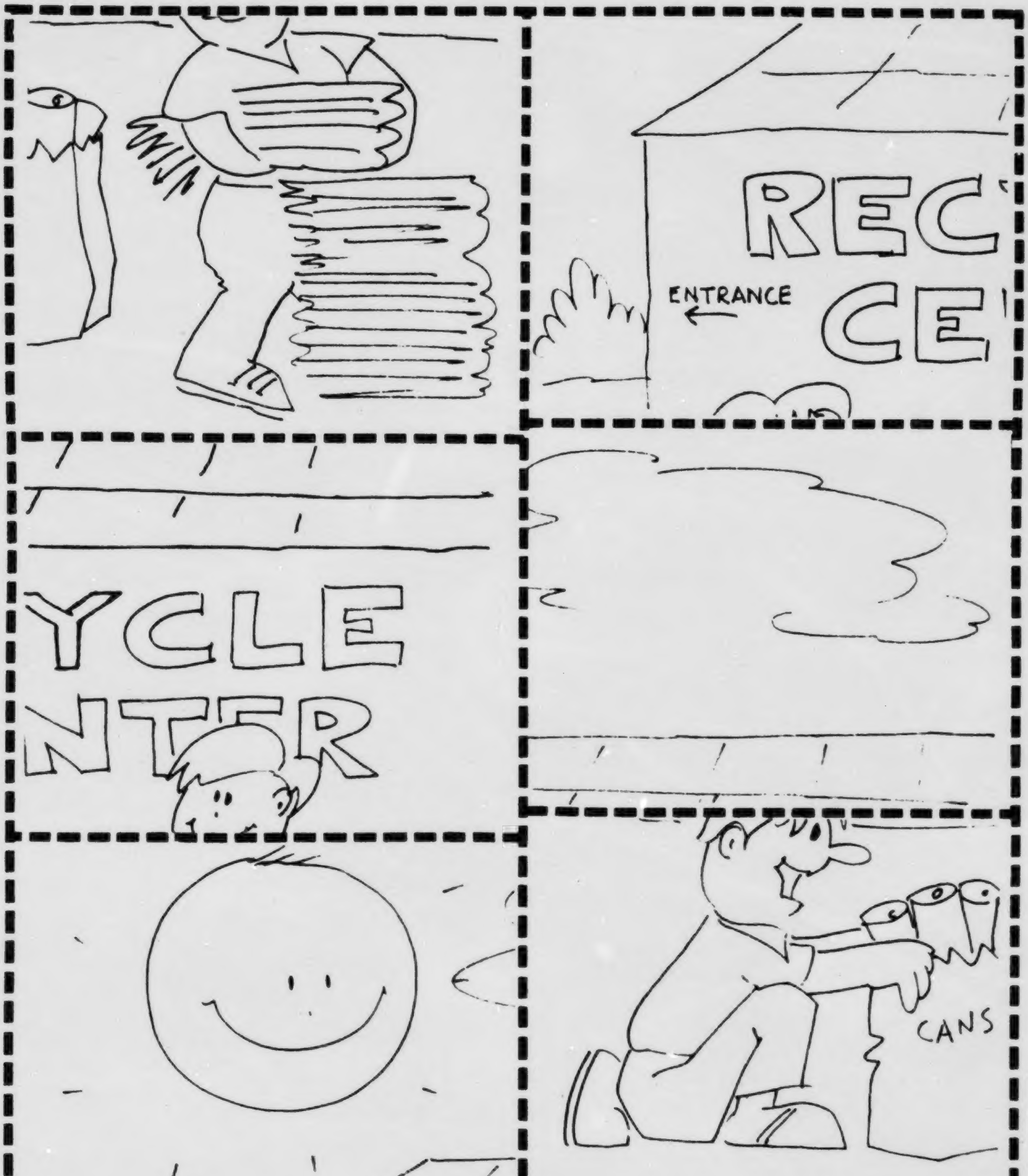


Keep your heat down

Name ______________________

Here is one way to save our natural resources.

Directions: Cut out the pieces. Put the puzzle together.


REC
ENTRANCE
CE
YCLE
NTER
CANS

RELATED ACTIVITIES

The following pages are ideas for integrating conservation activities with areas of the curriculum other than language arts, math, social studies and science. These activities are samples of those included in the 'All Levels' Guide which is the seventh book of the Conservation For Children series.

The 'All Levels' Guide contains activities and ideas for art, music, growing plants, and classroom projects, as well as student and teacher bibliographies. The activities and ideas are applicable to many grade levels.

Bird Feeders

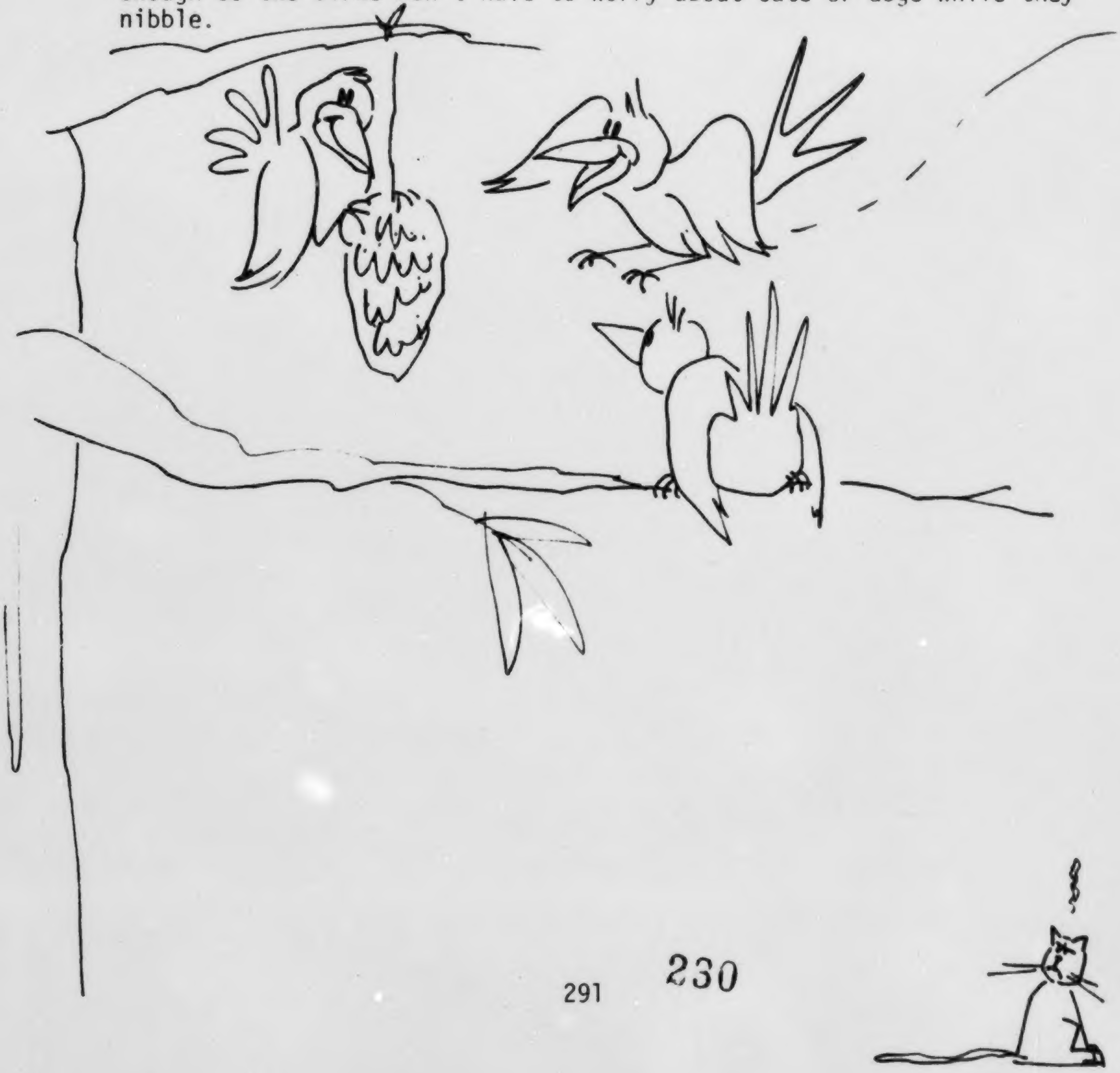
A special treat for backyard friends.

Things you will need:

- Pine cones
- Peanut butter
- Bird Seed
- String

What to do:

1. Rub the peanut butter on the pine cone.
2. Roll the covered pine cone in the bird seed.
3. Tie the string to the covered cone and hang from a tree. Hang it high enough so the birds won't have to worry about cats or dogs while they nibble.



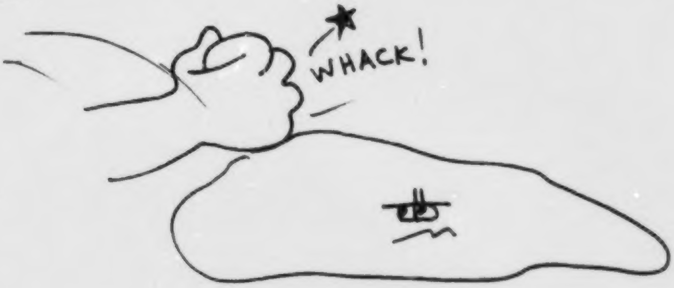
CERAMIC LEAVES

Materials needed:

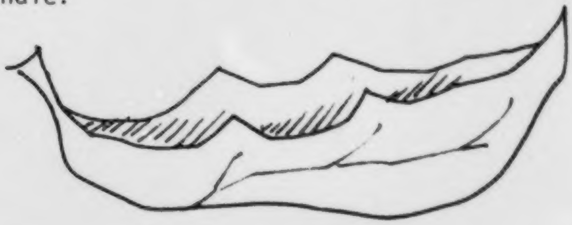
Ceramic clay
Large leaves, sycamore, maple or fruitless mulberry
Two strips of wood about ¼ in. thick
Rolling pin or dowel
newspaper or oil cloth
knife

Directions:

1. Pound clay to remove air bubbles.
2. Roll clay flat between two strips of wood. Make a slab large enough to fit leaf.



3. Remove stem from leaf. Place leaf, vein side down, on clay and roll with rolling pin or dowel to press into clay slab.
4. Use knife to cut outline of leaf. Leave about a 1½ inch strip to make stem.
5. Carefully remove leaf and bend edges of clay to resemble real leaf. Roll up stem to make a handle.



6. Let dry thoroughly. Fire in kiln.
7. Glaze, if desired. Fire again.

Garden Hats

You can make a cowboy hat, beach bonnet or a hat to keep the sun off your head when you're working in your garden.

It's a fun way to recycle newspapers, too.

Things you will need:

Old newspapers
Liquid starch
A bowl, big enough to fit on your head
Poster paint
Brush
Scissors

What to do:

1. Cut at least six large circles from open sheets of newspaper.
2. Lay one sheet at a time over the bowl and paint it with the liquid starch. The starch will hold the layers together and make the hat stiff.
3. After adding all the paper layers, shape the brim while the starch is still wet.
4. Let dry.
5. When the hat is completely dry, use your scissors to trim the edges. Paint the outside with poster paint. You can even decorate it with flowers, ribbons, or whatever you like.

GREENHOUSE GARDENS

If you have a plastic bag, you can have your own individual greenhouse.

Here's what you need:

A plastic bag, a quart size is good.

Planter mix

A peat pot (any kind of container will work, but you can plant the peat pot later)

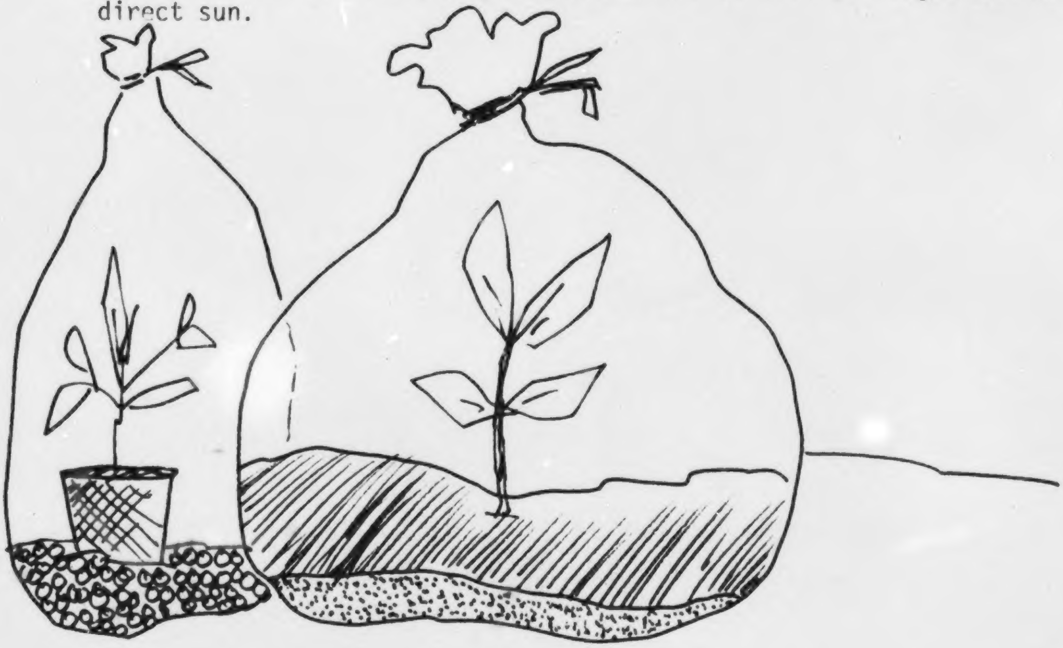
Pebbles or a little sand for drainage

Water

A plant cutting

Here's what to do:

1. Put a little sand or a few pebbles in the bottom of the plastic bag.
2. Fill the peat pot (or container) with planter mix.
3. Carefully plant the cutting.
4. Add water so that the planting mix is moist.
5. Put the pot in the plastic bag. Tie the top of the bag closed with a rubber band or the twist type bands that come with purchased plastic bags.
6. Set the closed greenhouse in a place where it will get light but not direct sun.



SPONGE GARDENS

Materials needed:

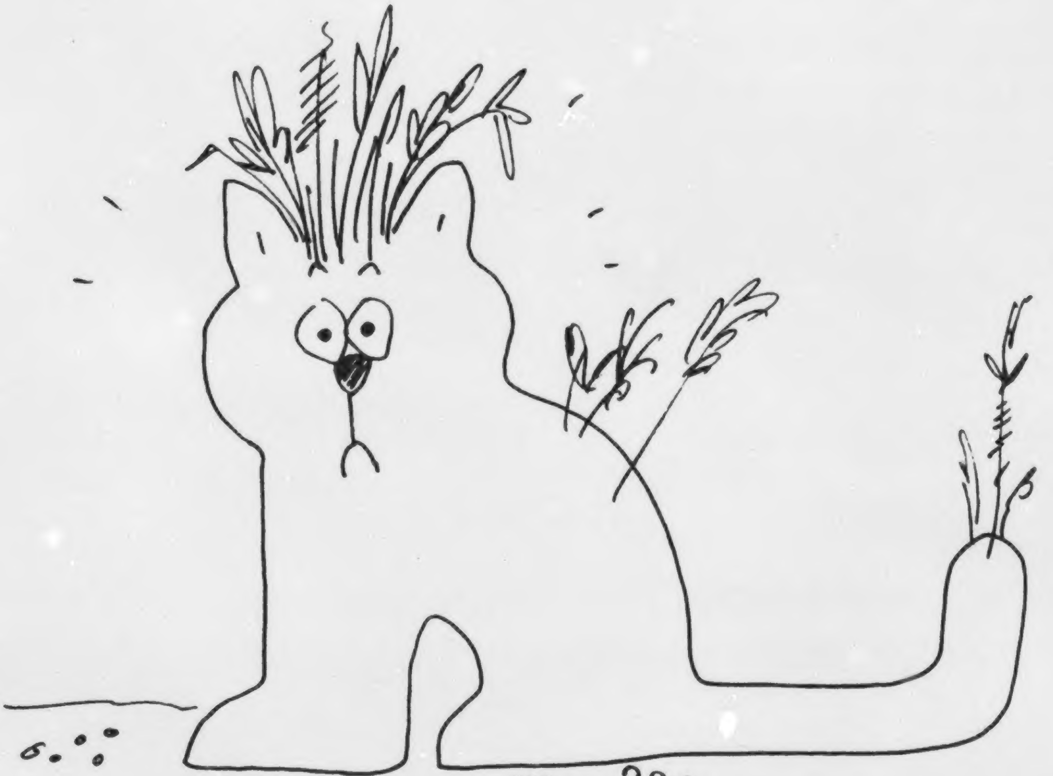
- A flat, thin sponge
- Water cress seeds (or mustard)
- Aluminum pie plate
- Water
- Scissors

Directions:

1. Cut sponge into animal or tree shape. (Left over pieces of sponge are great for sponge painting or crystal gardens.)
2. Put sponge shape in pie plate and add water.
3. Sprinkle seeds on top of sponge.
4. Add water to keep sponge moist.

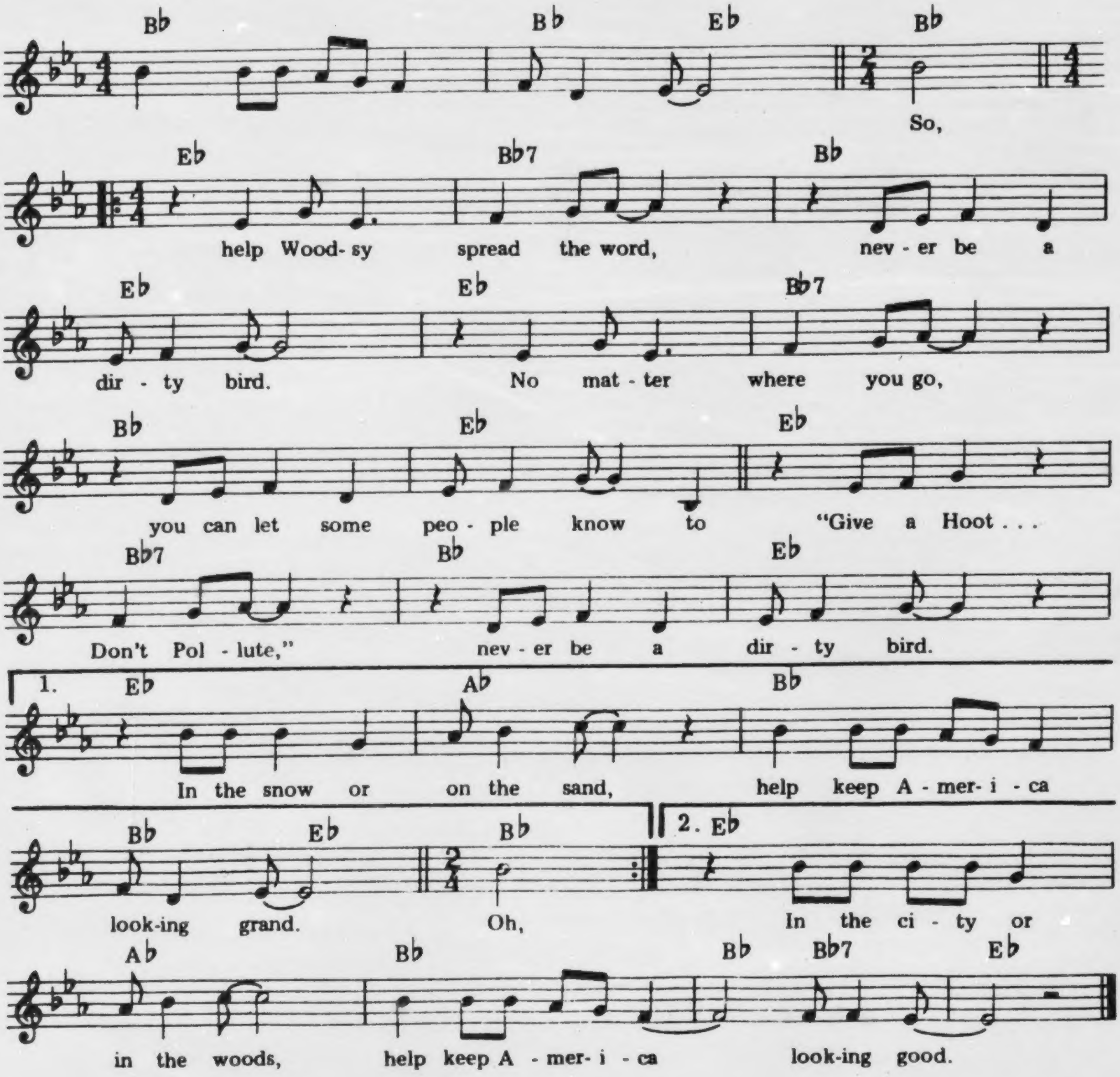
Seeds will sprout to form fuzzy green hair for your animal or pretty green leaves for your tree.

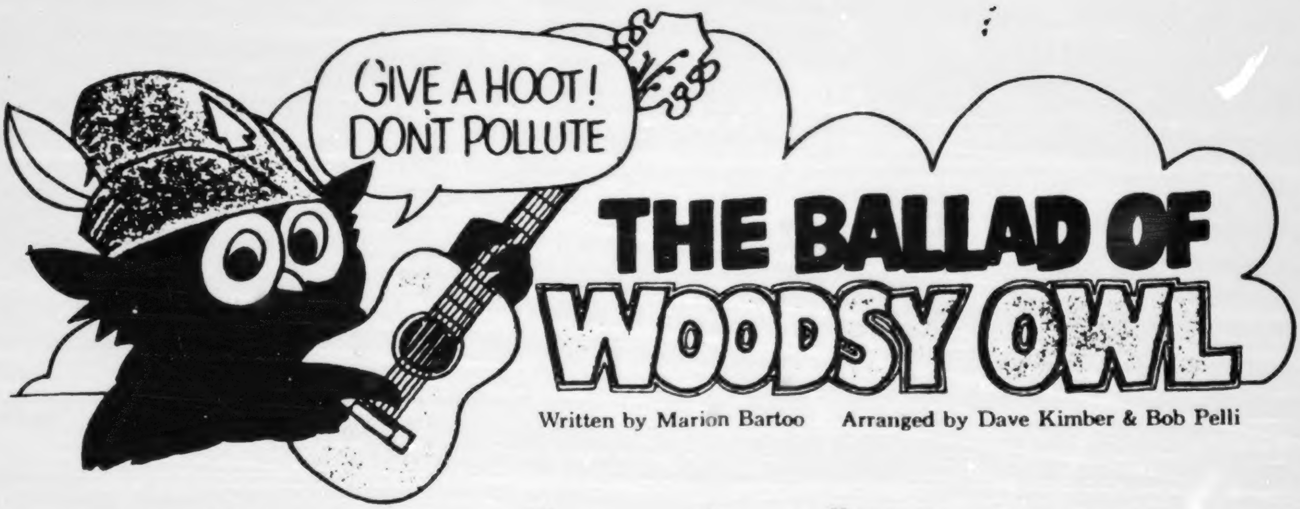
Snip off the green plants as they grow and add them to your sandwich for lunch.



Give a hoot! Don't pollute!

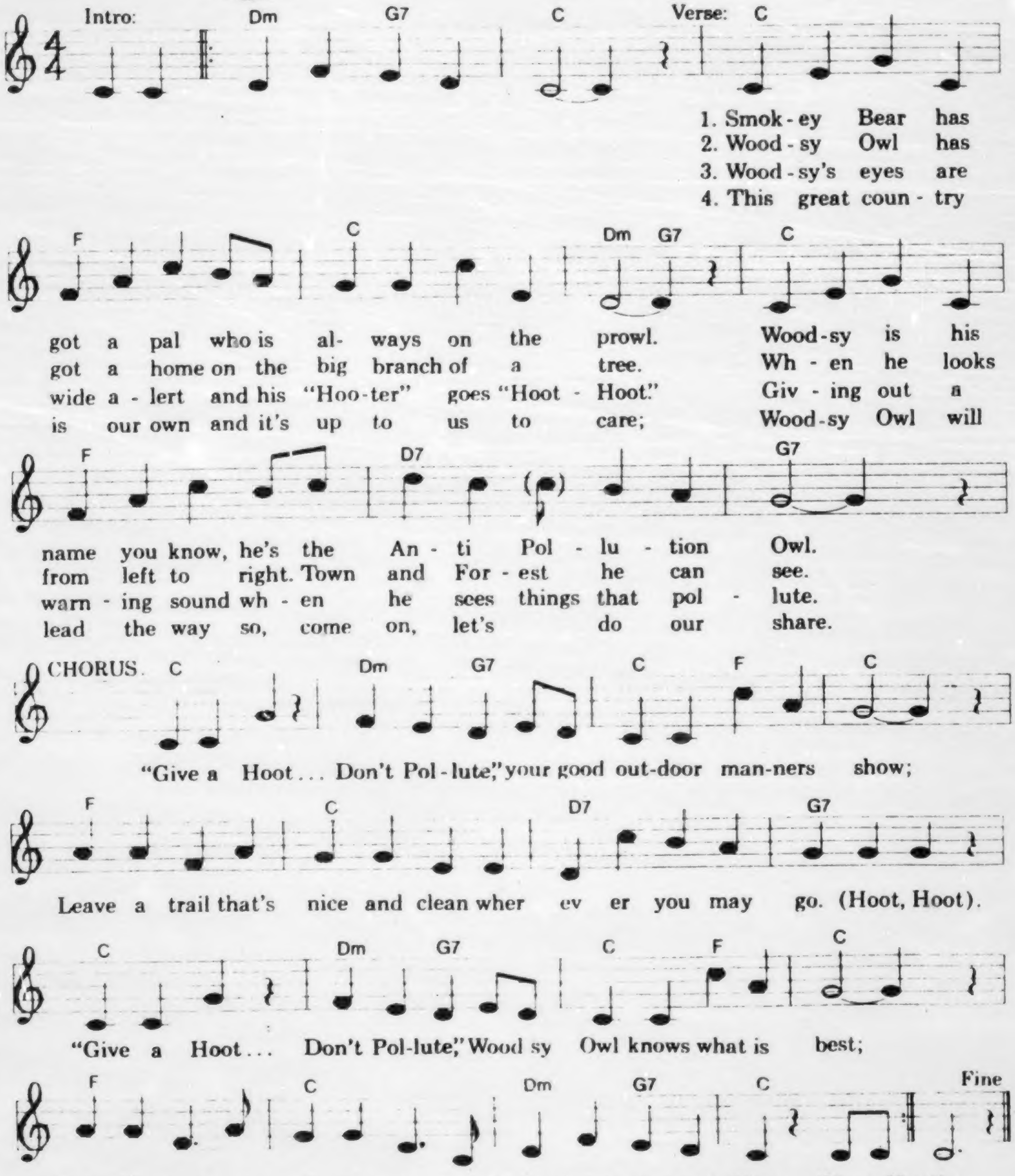
Help Woodsy spread the word...


So,
help Woodsy spread the word, never be a dirty bird.
No matter where you go, you can let some people know to "Give a Hoot . . .
Don't Pollute," never be a dirty bird.
1. In the snow or on the sand, help keep America looking grand. Oh,
2. In the city or in the woods, help keep America looking good.


GIVE A HOOT! DON'T POLLUTE

THE BALLAD OF WOODSY OWL

Written by Marion Bartoo Arranged by Dave Kimber & Bob Pelli


Intro:
Dm G7 C
Verse: C
1. Smok-ey Bear has got a pal who is al- ways on the prowl. Wood-sy is his name you know, he's the An - ti Pol - lu - tion Owl.
2. Wood-sy Owl has got a home on the big branch of a tree. Wh - en he looks from left to right. Town and For - est he can see.
3. Wood-sy's eyes are wide a - lert and his "Hoo-ter" goes "Hoot - Hoot." Giv - ing out a warn - ing sound wh - en he sees things that pol - lute.
4. This great coun - try is our own and it's up to us to care; Wood-sy Owl will lead the way so, come on, let's do our share.
F C Dm G7 C
F D7 G7
CHORUS. C Dm G7 C F C
"Give a Hoot... Don't Pol-lute," your good out-door man-ners show;
F C D7 G7
Leave a trail that's nice and clean wher ev er you may go. (Hoot, Hoot).
C Dm G7 C F C
"Give a Hoot... Don't Pol-lute," Wood sy Owl knows what is best;
F C Dm G7 C Fine
Help him check pol - lu - tion in the North, South, East and West... (Hoot, Hoot).

Things to Send For . . .

Many people are working together to keep our land beautiful. They will send you things so that you can learn how, too.

The Forest Service has two kits for children. One is the Woodsy Owl Kit which has decals, a bookmark, a picture of Woodsy, dot to dot activities, and lots of ideas on how you can help the environment. The other one is the Smokey Bear Junior Forest Ranger Kit. It tells how to be a junior forest ranger and has songs, pictures, a badge, and a junior ranger certificate. Both kits are free. If you would like one, write to:

The Forest Service, USDA
P.O. Box 2417
Washington, D.C. 20013

Ask for the Woodsy Owl Kit or the Smokey Bear Junior Forest Ranger Kit.

CHILDREN'S BOOKS FOR PLEASURE AND INFORMATION

1. Aliki. GREEN GRASS AND WHITE MILK. Thomas Crowell, New York, 1974.
2. Berenstain, Stan and Jan. BEAR'S NATURE GUIDE. Random House, New York.
3. Berenstain, Stan and Jan. BERENSTAIN BEARS' SCIENCE FAIR. Random House, New York.
4. Binzen, Bill. MIGUEL'S MOUNTAIN. Coward-McCann, Inc., 1968.
5. Burton, Virginia Lee. THE LITTLE HOUSE. Houghton-Mifflin, Boston.
6. Chargin, Claudia. IT'S YOUR WORLD. Troubador Press, $1.50.
7. Gabel, Margaret. SPARROWS DON'T DROP CANDY WRAPPERS. Dodd, Mead and Co.
8. Gans, Roma. WATER FOR DINOSAURS AND YOU. Thomas Crowell Co., New York, 1972.
9. Goudey, Alice E. THE GOOD RAIN. Dutton, Inc., New York, 1950.
10. Krauss, Ruth. THE CARROT SEED. Scholastic Book Services, New York, 1972.
11. Leaf, Munro. WHO CARES? I DO. J.B. Lippincott, Philadelphia.
12. McCloskey, Robert. MAKE WAY FOR DUCKLINGS. Viking Press, New York, 1941.
13. Peet, William. THE WUMP WORLD. Houghton-Mifflin, Boston, Mass.
14. Peet, William. FAREWELL TO SHADY GLADE. Houghton-Mifflin, Boston, Mass.
15. Pomerantz, Charlotte. THE DAY THEY PARACHUTED CATS ON BORNEO. Addison-Wesley, 1971.
16. Ruchlis, Hyman. THANK YOU MR. SUN! Harvey House.
17. Seuss, Dr. THE LORAX. Random House.
18. Silverstein, Shel. THE GIVING TREE. Harper and Row.
19. Tison, Annette and Taylor, Talus. BARBAPAPA's ARK. Scholastic Book Services.
20.
21.
22.
23.
24.

APPENDIX

ANSWERS:
    STUDENT WORKSHEETS
    CRITERION REFERENCED TEST

Environment is what is around every living thing.
Environment is what every living thing needs for life.

Here is a fish. Water is his environment.

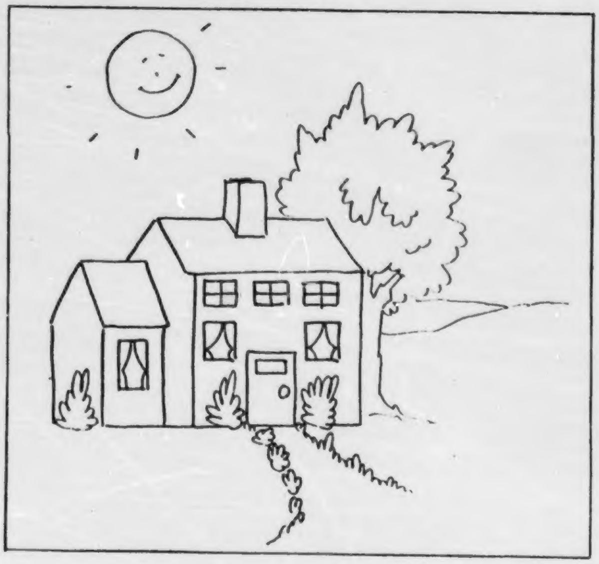
You could not live under the earth, but this worm likes it there. It is his environment.

This penguin lives at the south pole. He likes his environment cold.

This lizard and cactus live in a desert. They like their environment hot and dry.

This is your environment.

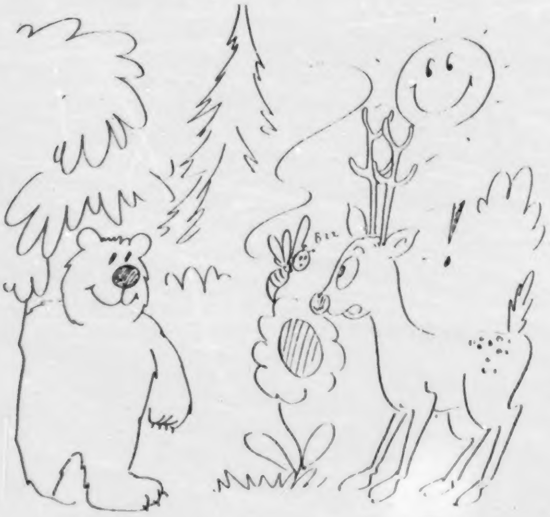
Draw yourself in the picture.



Write the word that means what is around every living thing.

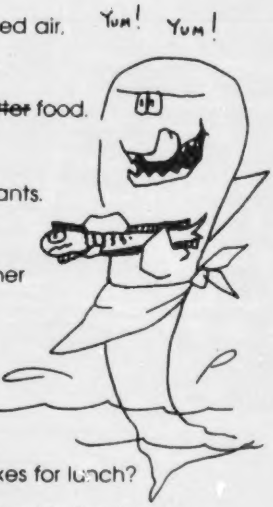
environment

Homonyms are words that sound alike but are spelled differently. Circle the words that you see in the picture.



[✓ sun] son bare [✓ bear]
[✓ flower] flour dear [✓ deer]
[✓ bee] be

Directions: There is an extra word in each of these sentences. Cross out the word that is not needed and write it on the line below.



1. All living things ~~peanut~~ need air, water, and sun to live.
2. Plants make their own ~~butter~~ food.
3. Some animals ~~and~~ eat plants.
4. Some animals eat ~~jelly~~ other animals.
5. Plants and animals need food to ~~fish~~ live.

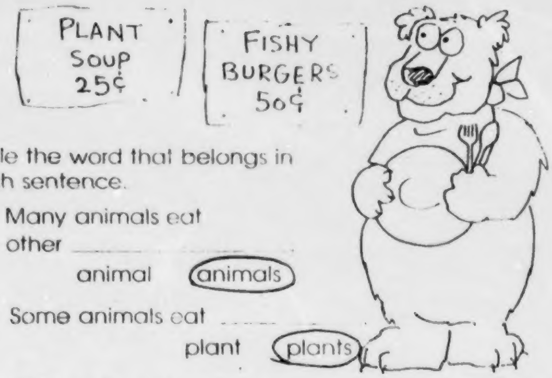
Do you know what a shark likes for lunch?

Write each word you crossed out in the blanks.

1. Peanut 2. butter 3. and

4. jelly 5. fish !

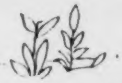
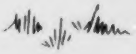
Answers: 210, 211, 212, 213

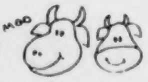
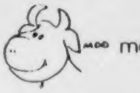


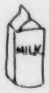
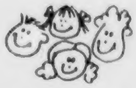
Circle the word that belongs in each sentence.

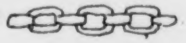
1. Many animals eat other ______
   animal [✓ animals]
2. Some animals eat ______
   plant [✓ plants]
3. This is part of nature's ______ chain.
   [✓ food] foods
4. Fish eat small water ______ and other smaller fish.
   plant [✓ plants]
5. Some ______ can catch fish to eat.
   bear [✓ bears]
6. Owls and eagles can catch small animals like
   rabbit [✓ rabbits]
7. ______ eat many plants and animals.
   [✓ People] Peoples
8. All plants and animals need each ______ to live.
   [✓ other] others

Directions: Use the pictures to read the story about food chains.

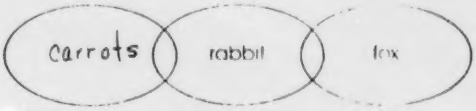
All food chains start with _  . 

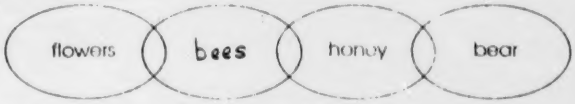
is eaten by  The  makes

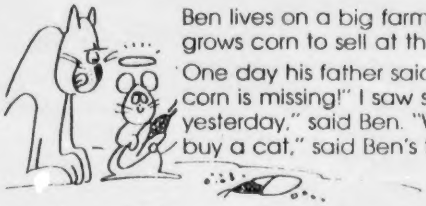
 .  drink the milk This is a

food  .

Use these words to fill in the missing part. bees carrots







Ben lives on a big farm. His father grows corn to sell at the market. One day his father said "some of our corn is missing!" I saw some big mice yesterday," said Ben. "We will have to buy a cat," said Ben's father.

Write a sentence to answer the questions.

1. Who lives on a farm?

Ben lives on a farm.

2. What does Ben's father grow?

His father grows corn.

3. What happened to the corn?

Some of it was missing.

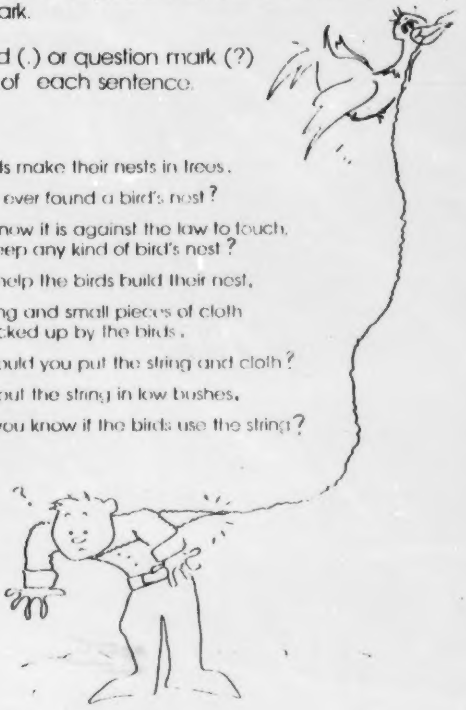
4. Why does Ben's father want to buy a cat?

So the cat can catch the mice.

Sentences that ask questions should end with a question mark.

Put a period (.) or question mark (?) at the end of each sentence.

1. Many birds make their nests in trees.
2. Have you ever found a bird's nest?
3. Did you know it is against the law to touch, take or keep any kind of bird's nest?
4. You can help the birds build their nest.
5. Bits of string and small pieces of cloth will be picked up by the birds.
6. Where should you put the string and cloth?
7. You can put the string in low bushes.
8. How will you know if the birds use the string?



We know that all plants and animals have their own habitats.

Write the names of these plants and animals in the right habitat.

whale cactus bear tortoise

squirrel lizard seaweed deer seal

OCEAN

DESERT

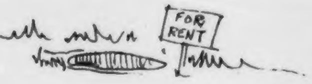
FOREST

OCEAN	DESERT	FOREST
whale	cactus	bear
seaweed	tortoise	deer
seal	lizard	squirrel

Habitats

Plants and animals have many kinds of homes. These homes where they live and grow best are called their habitats. Every animal and plant has its very own habitat.

1. An animal that lives in a cold place (place) (places) is the polar bear.
2. The polar bear has lots of fur (fur) (furs) to keep him warm.
3. Worms (Worm) (Worms) live under the ground.
4. A mole lives under the ground (ground) (grounds), too.
5. Squirrels make their nests (nest) (nests) in the holes of trees.
6. The cactus plant grows (grow) (grows) best in hot dry places.
7. Beavers build their homes (home) (homes) in the middle of ponds and streams.
8. The beaver makes his home out of sticks (stick) (sticks) and tree limbs that he has cut down.



Directions: Use these words to complete the sentences.

land water habitat sea place

1. Some animals live in the water.
2. Seals, whales and fish live in the sea.
3. Other animals live on the land.
4. Each animal has its own special place.
5. An animals home is called its habitat.

Write the numbered letters on the spaces below to answer the riddle.

What animal do you look like when you take a bath?

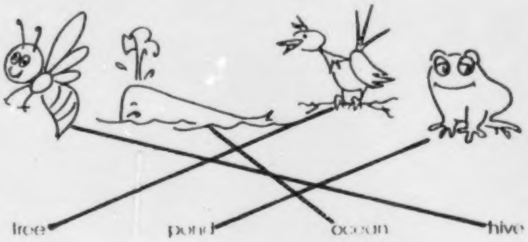
a little bear!

Directions: Use these words to complete the rhymes.

bees snails rats dogs seals

1. Some rivers have slippery eels
   Some oceans have fast swimming seals.
2. The biggest sea animals are whales
   Slow moving garden animals are Snails.
3. Croaking at night comes from frogs
   Barking at night comes from dogs.
4. Some people have several cats
   to chase away the mice and rats.
5. A dog may be scratching because of fleas.
   Sweet honey is made by bees.

Draw a line from the animal to the place where he lives.



Answers: 218, 219, 220, 221

Left and Right

Up and Down

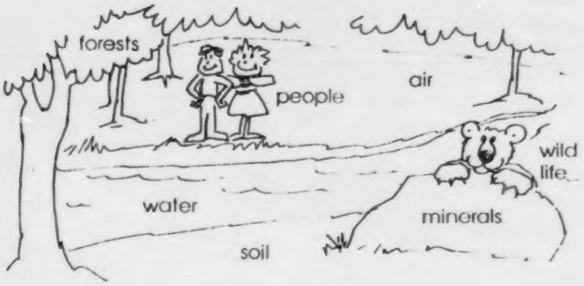
O	U	[D]	S	[R]	E	L	R	E
K	C	L	O	O	M	A	A	V
L	A	E	[M]	B	I	[C]	E	R
P	R	[S]	A	X	N	T	[B]	S

1. This animal makes its home in a tree.
   [R], down down, right, down R O B I N
2. Here is an animal that lives under the ground.
   [M], up, left, down M O L E
3. He makes his house in the middle of a pond.
   [B], up, up, right, up, left. B E A V E R
4. This animal lives in the ocean.
   [S], up, left, left. S E A L
5. This animal can live in the water and on the land.
   [D], left, down, left. D U C K
6. Here is an animal that can live in a hot, dry land.
   [C], up, left, up, right. C A M E L

Write these words in A B C order.

sun	1. air
water	2. dirt
gas	3. gas
litter	4. litter
air	5. sun
dirt	6. water

Here are seven of our natural resources. Write the name of the correct natural resource in the blank space in each sentence.



1. We need water to drink, to bathe in, and to wash clothes in.
2. Plants, animals, and people need air to breathe.
3. We need soil to grow plants in.
4. Salt, chalk, and silver are some of the minerals we use.
5. People need to use other natural resources wisely and to save them for the future.
6. We use our forests for wood to build houses and furniture.
7. Rabbits, bears, and deer are part of our wildlife

Natural Resources

Natural resources are things we get from nature. Water is a natural resource. The sun is another natural resource. Trees and minerals are natural resources, too.

We use our natural resources to make the many things we use everyday. They also give us energy and power.

Write "yes" or "no" after each question.

1. Is a river a natural resource? yes
2. Is sunlight a natural resource? yes
3. Is a plastic cup a natural resource? no
4. Is wood a natural resource? yes
5. Is a book a natural resource? no
6. Is gold a natural resource? yes

Answers: 222, 223, 224, 225

Glass

The glass jars and bottles that food comes in were once plain old sand. At a glass factory, the sand is heated in large vats until it melts. Then the melted sand is mixed with baking soda and chalk. This makes glass.

While the glass is hot, it can be made into different shapes. It can be rolled flat for windowpanes or poured into molds to make cups, vases, bowls, and other useful things.

Old glass jars and bottles can be melted again to make new glass.

Write yes in front of the sentences that are correct.

Write no in front of the sentences that are not correct.

yes 1. Glass is made from sand.

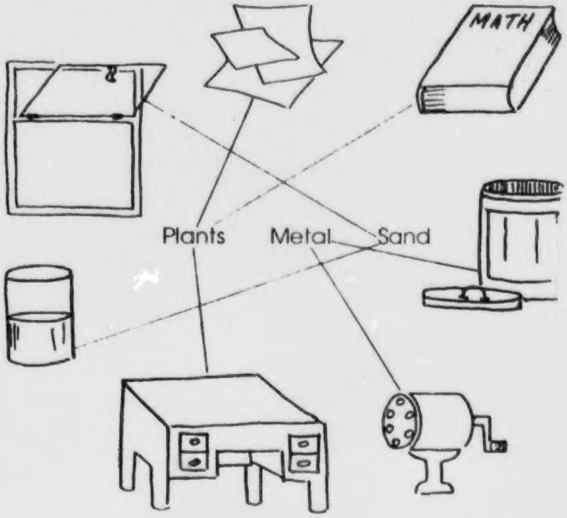
no 2. The sun melts the sand at the beach.

no 3 Glass is rolled flat to make light bulbs.

yes 4 Glass is made into cups and bowls while it is hot.

yes 5 Old glass can be melted again to make new glass.

Here are some things in your classroom. Some are made from plants. Some are made from metal. And some are made from sand. Draw a line from the picture to the word or words that tell what it is made from.



Grass

Grass is the largest crop on the earth. Grass gives us the food for our animals so we can have meat, milk, eggs, and wool. Wheat, rice, sugar cane, oats, and corn are grasses, too.

Grass keeps the soil from washing or blowing away. It also puts important things into the soil so we can grow better fruits and vegetables to eat.

OUTER SPACE LAWN MOWER COMPANY

Write the following words in the correct boxes.

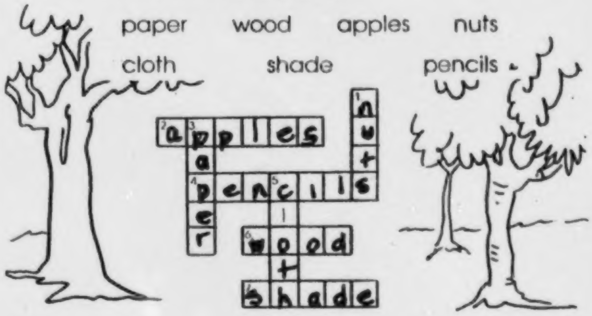
milk nuts grass rice oats
fruit cob cane meat eggs

	a	e	i	o	u
long vowel	cane	meat	rice	oats	Fruit
short vowel	grass	eggs	Milk	cob	nuts

Trees

Trees are one of our natural resources. They give us many things. Use the names of these things we get from trees to finish the puzzle.

paper wood apples nuts
cloth shade pencils



Clues:

Words Across

2 These are juicy and good to eat.

4 You use these to write with

6 This is used to build houses, tables, and sometimes toys

7 A good place to sit when it's hot

Words Down

1 Most of these have hard shells

3 You write on this

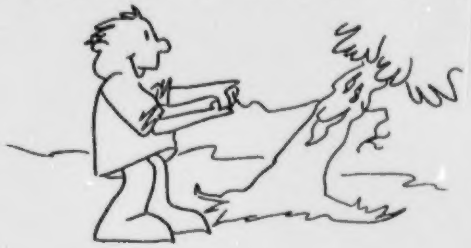
5 This is used to make clothes

Can you think of other things that come from trees? Write as many as you can

Answers: 226. 227, 228, 229

Directions: A word in each sentence is all mixed up. Unscramble the letters and write the word correctly on the blank space.

1. Most paper is made from doow. wood
2. The pages of your book were once a eert. tree
3. Nasd is used to make glass. Sand
4. Plastic is made from iol. oil
5. Minerals give us many matles. metals
6. We need to vesa our natural resources. save
7. We should be careful not to teaws them. waste



230

[w l s c]

Use the letters to make words that match the meanings.

clean	How we should keep our environment.
litter	Paper thrown on the ground.
waste	What we should be careful not to do.
smog	Dirty air.

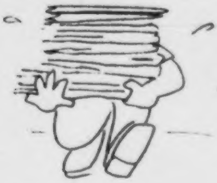
Fill in the spaces with letters to make a word.

1. Paper is made from plants.
2. When we use both sides of a paper, we are saving trees.
3. Sand is used to make glass.
4. Glass bottles and jars can be used over and over again.
5. We use oil to make plastic.
6. Plastic cannot be melted to use again.

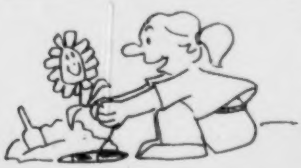
231

Many people are helping to keep our environment clean.

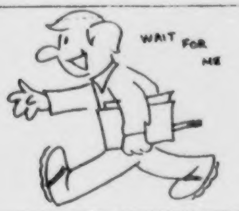
Directions: Look at each picture. Then draw a line under the answer to the question.



How is Sarah helping?
[✓ She is saving newspapers to recycle.]
She is reading a newspaper.
Sarah is making a hat.



How is Marie helping?
Marie is building a house.
She is petting her dog.
[✓ Marie is planting flowers.]



How is Bill helping?
He is riding in a car.
[✓ He is walking to school.]
He is eating ice cream.

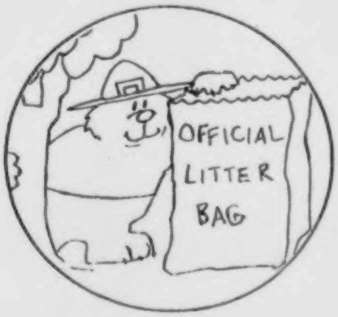
232

Circle the compound words in this story.

DON'T BE A LITTERBUG

Litter along our highways and on our playgrounds is an ugly sight. We must do our part to keep litter off the roadside, out of our campgrounds, and in the wastebasket. You can help by making and using a litterbag for your car.

Color the picture. Cut it out and paste it on a small paper bag. Put the bag in your car to hold your litter.



233

Answers: 230, 231, 232, 233

Each alphabet has a letter missing. Write the missing letters on the spaces below.

Find out how you can keep our country beautiful.

1. A B C D E F G H I J K L M N O Q R S T U V W X Y Z
2. A B C D E F G H J K L M N O P Q R S T U V W X Y Z
3. A B D E F G H I J K L M N O P Q R S T U V W X Y Z
4. A B C D E F G H I J L M N O P Q R S T U V W X Y Z
5. A B C D E F G H I J K L M N O P Q R S T V W X Y Z
6. A B C D E F G H I J K L M N O Q R S T U V W X Y Z
7. A B C D E F G H I J K M N O P Q R S T U V W X Y Z
8. A B C D E F G H J K L M N O P Q R S T U V W X Y Z
9. A B C D E F G H I J K L M N O P Q R S U V W X Y Z
10. A B C D E F G H I J K L M N O P Q R S U V W X Y Z
11. A B C D F G H I J K L M N O P Q R S T U V W X Y Z
12. A B C D E F G H I J K L M N O P Q S T U V W X Y Z

Answer P I C K U P L I T T E R
1 2 3 4 5 6 7 8 9 10 11 12

234

Copy these words in cursive.

litter litter

smog smog

waste waste

habitat habitat

recycle recycle

pollution pollution

ecology ecology

conservation conservation

235

Directions: Mark the circle in front of the word in each box that is not spelled correctly.

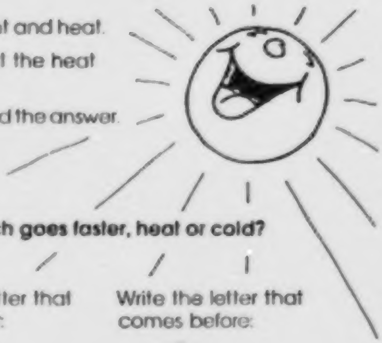
1 ○ saving ○ water ● bottel ○ myself	5 ○ rain ● clode ○ litter ○ weather	9 ● duste ○ recycle ○ dripping ○ snow
2 ○ leaf ● papir ○ car ○ trash	6 ○ orange ○ gas ○ river ● animul	10 ○ flowers ○ soot ● smok ○ ocean
3 ○ pick ● durt ○ trees ○ lemon	7 ● plints ○ walking ○ wind ○ smog	11 ○ seven ○ air ● forrest ○ beaver
4 ● clene ○ pollution ○ truck ○ sun	8 ○ dirty ○ yellow ○ waste ● earht	12 ○ cars ● frute ○ lake ○ green

236

The SUN gives us light and heat.

This is a riddle about the heat from the sun.

Fill in the letters to find the answer.



Which goes faster, heat or cold?

Write the letter that comes after:

G H
D E
A
S T .

A B
D E
B C
A
T U
R S
D E

X Y
N O
T U

Write the letter that comes before:

C D
A B
N O

C D
A B
T U
C D
H I

C D
O P
L M
D E

237

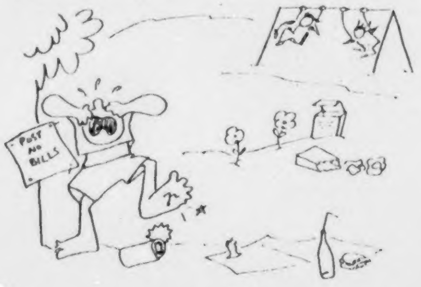
Answers: 234, 235, 236, 237

Directions: Draw a line under the contraction in each sentence.

Write the two words that mean the same as the contraction on the blank spaces.

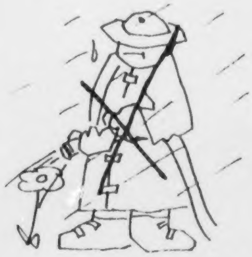
1. Trash isn't nice to see in parks or playgrounds. is not
2. Don't throw litter on the ground. do not
3. Papers and trash aren't good for plants or animals. are not
4. If you can't find a garbage can, take your trash home with you. can not
5. It wouldn't be fun to play in a park covered with litter. would not

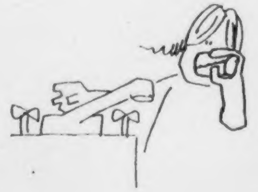
Color the picture. Color over the parts that are not nice to see.

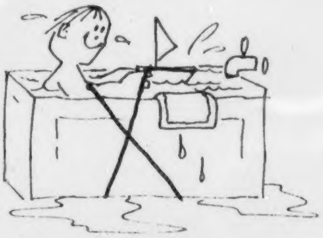


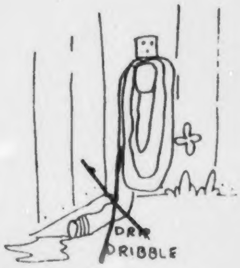
Water is our most important natural resource. People, other animals, and plants cannot live without clean water. It is important that we do not waste or pollute our water.

Put an X on the pictures that show water being wasted.





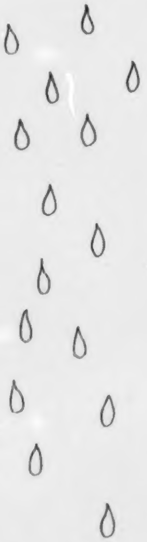




Directions: A sentence is a complete thought. Write an "S" before each complete sentence you find below.

Water is everywhere.

S 1. The earth has a lot of water.
S 2. We need water to drink.
___ 3. In the ocean.
S 4. There is water in the ground.
___ 5. Pails of water.
S 6. The water in the ocean is salty.
S 7. There is even water in the air.
___ 8. A large blue lake.
S 9. All animals and plants need water.
S 10. There is water in lakes and streams.
___ 11. Running water from the hose.
S 12. Water is wet.

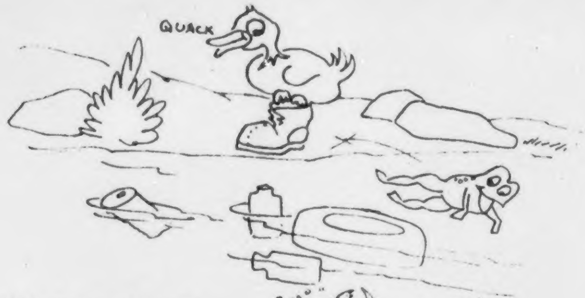


Circle the word that belongs in each sentence.

1. Fish do not ______ well in dirty water.
   [✓ live] lives living
2. No one ______ to drink water that is not clean.
   want [✓ wants] wanting
3. ______ in dirty water is no fun.
   Swim Swims [✓ Swimming]
4. Don't ______ papers into rivers or lakes.
   [✓ throw] throws throwing
5. Dirty water is ______ polluted water.
   call calling [✓ called]
6. Everyone should work to ______ our water clean.
   [✓ keep] keeps keeping

247

Answers: 238, 239, 240, 241



Write one of these words in each sentence.

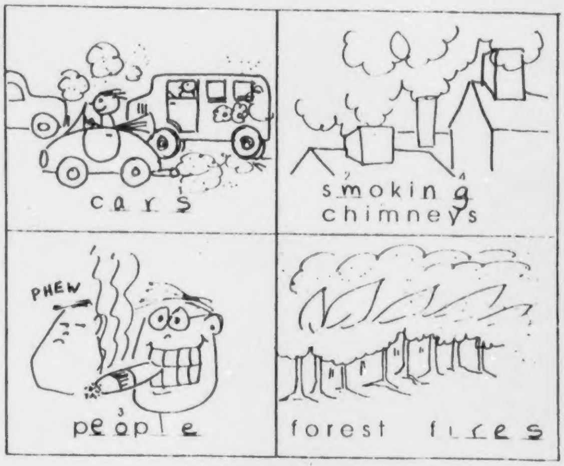
over in beside on under

1. There is litter in the water.
2. The frog is jumping over an old tire.
3. There are bottles beside the tire.
4. The fish is trying to swim under the litter.
5. The duck is sitting on an old shoe.

How could we help the fish, the duck, and the frog?

242

Write the names of these things that cause air pollution.

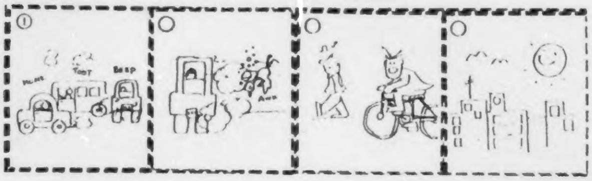


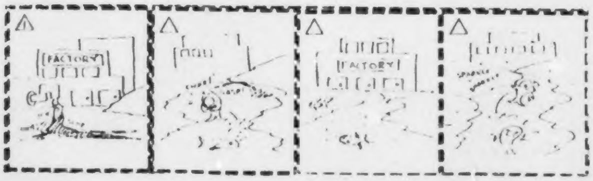
What do we call dirty air? Use the letters with numbers under them to make the word.

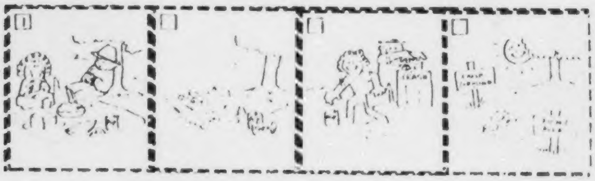
$\underset{1}{s}\;\underset{2}{m}\;\underset{3}{o}\;\underset{4}{g}$

243

Pollution Solutions — Cut out the pictures on the dotted lines and paste them in the right order.
○ = Air △ = Water ☐ = Earth





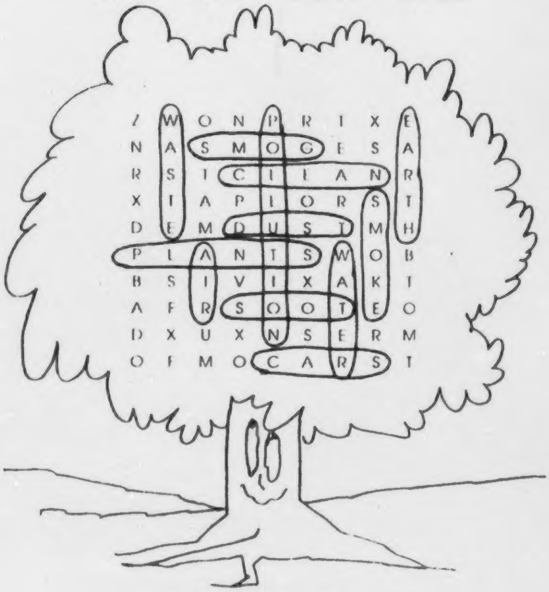


244

Word Hunt

Circle these ecology words as you find them in this puzzle.

WASTE SOOT POLLUTION WATER
AIR PLANTS SMOG SMOKE
DUST CARS CLEAN EARTH



Z	W	O	N	P	R	I	X	E
N	A	S	M	O	G	E	S	A
R	S	I	C	L	E	A	N	R
X	T	A	P	L	O	R	S	T
D	E	M	D	U	S	T	M	H
P	L	A	N	T	S	W	O	B
B	S	I	V	I	X	A	K	T
A	F	R	S	O	O	T	E	O
D	X	U	X	N	S	E	R	M
O	F	M	O	C	A	R	S	T

245

Answers: 242, 243, 244, 245

Draw a line from the beginning of the sentence to the right ending.

All plants and animals	can make the air dirty.
Cans and bottles	need water to live.
Cars and trucks	can be recycled.
Conservation means to	use things wisely.

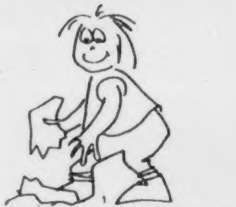
CONSERVE
SAVE
RE-CYCLE

Complete the sentence with your own words.

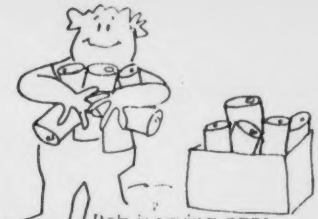
Dirty water is ______________________

Everyone should save ______________________

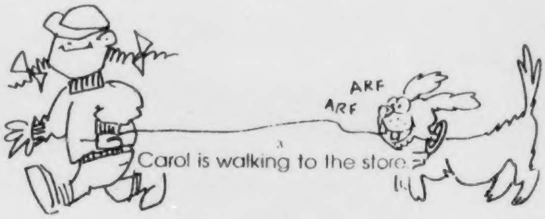
We can all help to ______________________



Liz is picking up papers.



Bob is saving cans.



Carol is walking to the store.

Put 1 if it tells about what Liz is doing.
Put 2 if it tells about what Bob is doing.
Put 3 if it tells about what Carol is doing.

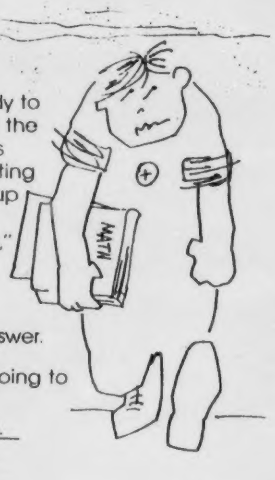
3 This will save gasoline.
1 This will make the playground look better.
2 These will be recycled and made into new ones.
3 This can help to keep our air clean.
1 Someone has to do this when people are litterbugs.

Read the story. Number the sentences 1, 2, 3, and 4 the way they happened in the story.

Mike and Melissa went to the park. They were going to have a picnic. They brought peanut butter and jelly sandwiches, cookies, and two cans of soda.

After they ate their lunch, Melissa wanted to play on the swings. Mike thought they should put their trash in the trashcan first. Melissa did not want to be a litterbug, so they picked up the trash. Then they played on the swings.

2 They ate peanut butter and jelly sandwiches for lunch.
1 Mike and Melissa went to the park for a picnic.
4 They played on the swings.
3 They put their papers and cans in the trashcan.



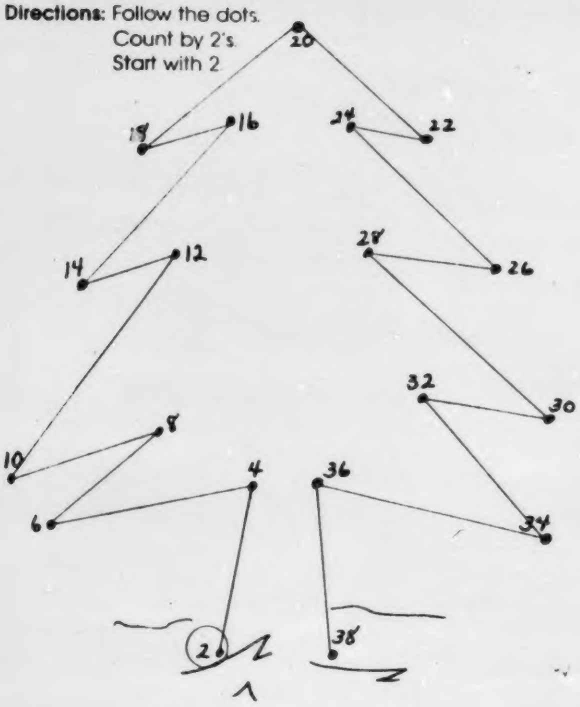
Matt's mother was getting ready to drive him to school. As they left the house, Matt said, "The air smells funny today." "My eyes are hurting too." "We need to help clean up this dirty air," he said.
"I think I'll walk to school today," said Matt. And he did!

Draw a line under the right answer.

1. Matt's mother was going to
   go to the store.
   [✓ drive him to school.]
2. The dirty air was
   [✓ hurting his eyes.]
   hurting his feet.
3. Matt knew that dirty air could be
   [✓ caused by cars.]
   bad for plants.
4. He helped to clean up the air by
   not smelling it.
   [✓ walking to school.]

Answers: 246, 247, 248, 249

Directions: Follow the dots.
Count by 2's.
Start with 2.



This is used to make paper.

250

Directions:
Find the ecology message.
Use the code to fill in the missing letters.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
I	A	V	E	T	F	O	N	U	R	P	H	L	G	S

8	9	10	9
+5	-9	-8	-6
13	0	2	3
G	I	V	E

12
-11
1
A

5	12	12	11
+8	-12	-7	-7
13	0	5	4
G	I	F	T

12	13
-8	-7
4	6
T	O

13	10	13	15	11	13
-6	-9	-9	-7	-2	-10
7	1	4	8	9	3
N	A	T	U	R	E

4	7	9	13	9
+6	+5	-8	-6	-5
10	12	1	7	4
P	L	A	N	T

8
-7
1
A

8	6	12	11
-4	+3	-9	-8
4	9	3	3
T	R	E	E

14	3
-8	+6
6	9
O	R

	6	7	6
	+2	+7	+5
	8	14	11
B	U	S	H

251

Directions:
Write a number sentence.
Give the answer.

12 🪰 s.

A 🐸 ate 6.

How many 🪰 s were left?

12 - 6 = 6 🪰 s.

17 🐸 s. A 🐍 ate 3.

How many 🐸 s were left?

17 - 3 = 14 🐸 s.

14 🐍 s. An 🦅 ate 7.

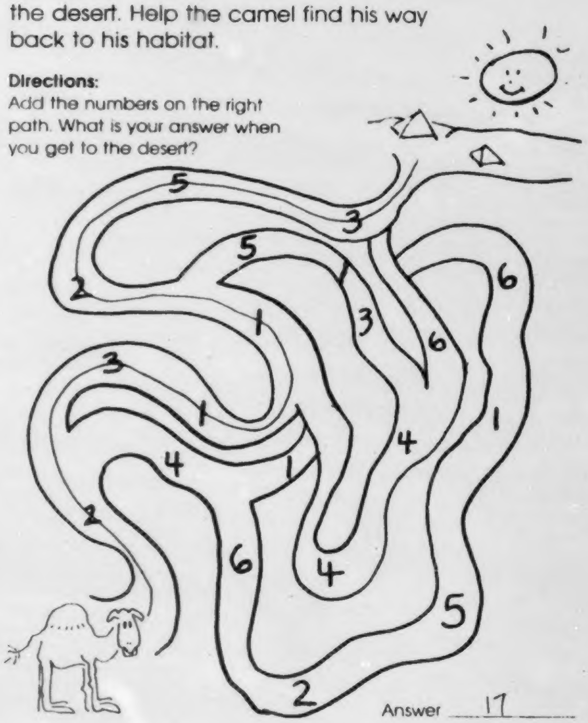
How many 🐍 s were left?

14 - 7 = 7 🐍 s.

252

The camel's habitat is the desert. Help the camel find his way back to his habitat.

Directions:
Add the numbers on the right path. What is your answer when you get to the desert?



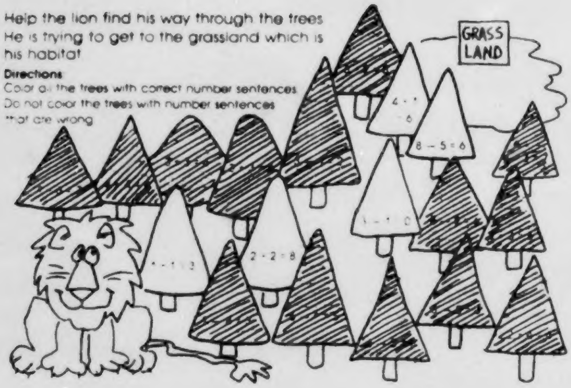
Answer 17

253

Answers: 250, 251, 252, 253

Help the lion find his way through the trees
He is trying to get to the grassland which is his habitat

Directions
Color all the trees with correct number sentences
Do not color the trees with number sentences that are wrong



254

What does
Woodsy Owl say?

Directions:
Do the problems.
Use your answers to find out.

E 43 + 8 51	H 72 + 9 81	T 84 + 4 88	I 46 + 8 54
P 83 + 7 90	O 44 + 2 46	V 92 + 8 100	A 35 + 7 42
D 96 + 5 101	N 28 + 8 36	L 46 + 9 55	U 79 + 7 86

G I V E   A   H O O T
_ 54 100 51   42   81 46 46 88

D O N'T   P O L L U T E!
101 46 36 88   90 46 55 55 86 88 51

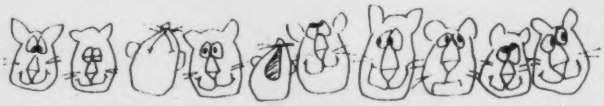
255

Here are some examples of how the food chain works.

Directions:
Read the problem.
Do the work.

1. There were 46 ears of corn in the barn. Along came some mice who ate 14 of them. How many ears of corn were left?	46 −14 32
2. There were 12 mice eating some corn. A cat caught and ate 6 of the mice. How many were left?	12 − 6 6
3. Growing on the sides of the river were 68 little plants. A school of fish came by and ate 24 of the plants. How many were left?	68 − 24 44
4. There were 38 little minnows in the school of fish. Six big fish swam by and gobbled up 22. How many little minnows were left?	38 − 22 16
5. A pelican saw the 6 big fish. He dove down and ate 2 of them. How many fish were left?	6 − 2 4

256



Follow the directions.
Put N on the third space.
Put O on the second space.
Put D on the fourth space.
Put P on the first space.

The habitat for a frog is a P O N D
1 2 3 4

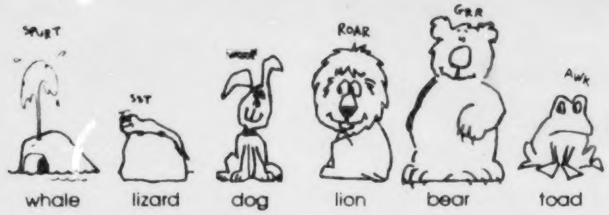
Put S on the fourth space.
Put N on the eighth space.
Put R on the second space.
Put D on the ninth space.
Put G on the first space.
Put A on the seventh space
Put S on the fifth space
Put L on the sixth space
Put A on the third space

The habitat for a giraffe is the

G R A S S L A N D
1 2 3 4 5 6 7 8 9

257

Answers: 254, 255, 256, 257



Directions:
Write the name of the correct animal on each space.

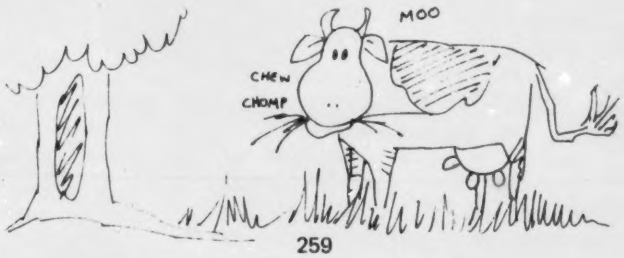
1. The fourth animal lives in the grasslands. That is its habitat.
It is a *lion*.
2. The habitat for the fifth animal is the forest.
It is a *bear*.
3. The second animal's habitat is the desert.
It is a *lizard*.
4. The habitat for the sixth animal is the pond.
It is a *toad*.
5. The third animal is someone's pet. Its habitat is the city. The third animal is a *dog*
6. The first animal lives in the ocean. That is its habitat. It is a *whale*.

What do all food chains begin with?
Do the problems to find out.

3 4 + 2 9 = T	1 5 + 7 13 = P	2 8 + 1 11 = B	6 3 + 5 14 = N
2 1 + 9 12 = S	6 7 + 2 15 = W	9 1 + 6 16 = A	3 2 + 5 10 = L

Directions:
Write the letter of the answers that match.

All food chains begin with *P* (13) *L* (10) *A* (16) *N* (14) *T* (9) *S* (12)



Directions:
Fill in the missing numbers.

1	2	3	4 N	5	6	7	8	9	10
11 A	12	13	14	15	16 S	17	18	19	20
21	22 R	23	24	25	26	27	28	29	30 D
31	32	33	34	35	36	37 O	38	39	40
41 W	42	43	44	45 I	46	47	48	49 T	50 E
51	52	53	54	55	56	57	58 L	59	60

Answer the question below by filling in the spaces. Use the letters in the boxes that match the numbers under each space.

What are three of our natural resources?

S (16) *O* (37) *I* (45) *L* (58), *A* (11) *I* (45) *R* (22), *A* (11) *N* (4) *D* (30)

W (41) *A* (11) *T* (49) *E* (50) *R* (22).

The farm is a habitat for many animals. Chickens, ducks, cows, and pigs are often found on the farm.

Directions:

Write the number that comes just before:	Write the number that comes just after:
4 = *3* = L	4 = *5* = D
8 = *7* = N	10 = *11* = I
31 = *30* = M	19 = *20* = A
46 = *45* = C	33 = *34* = S
60 = *59* = W	52 = *53* = E
74 = *73* = U	79 = *80* = K
98 = *97* = R	88 = *89* = Q

Use your answers to solve the riddle. Match the numbered spaces to the numbers you wrote. Write the letter.

What does a farmer have if he owns a cow and a duck?

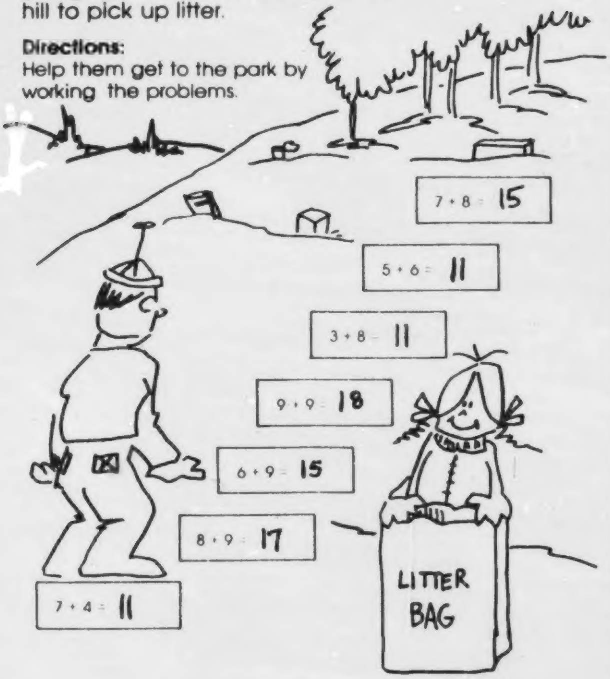
M (30) *I* (11) *L* (3) *K* (80) *A* (20) *N* (7) *D* (5)

Q (89) *U* (73) *A* (20) *C* (45) *K* (80) *E* (53) *R* (97) *S* (34)

Answers: 258, 259, 260, 261

Johnny and Susie want to help keep their environment clean. They are going to the park at the top of the hill to pick up litter.

Directions:
Help them get to the park by working the problems.



7 + 8 = 15
5 + 6 = 11
3 + 8 = 11
9 + 9 = 18
6 + 9 = 15
8 + 9 = 17
7 + 4 = 11

Directions:
Circle the correct number that completes the number sentence.
Write the letter that is under the correct number on the blank spaces.

4 + 5 = 9			3 + 9 = 12			2 + 7 = 9			1 + 9 = 10		
8	9	7	9	4	8	4	1	2	8	2	9
P	S	T	A	B	O	W	M	N	L	R	D

Glass is made from S A N D.

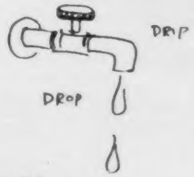
6 + 5 = 11			2 + 8 = 10			3 + 6 = 9		
3	5	4	8	7	9	2	4	3
B	O	T	I	A	R	T	O	L

Plastic is made from O I L.

8 + 7 = 15			6 + 4 = 10			7 + 2 = 9			3 + 3 = 6		
9	2	7	3	6	1	7	4	6	2	5	6
P	X	W	G	O	I	O	R	J	A	S	D

Paper is made from W O O D.

Directions:
Write the number that means the same as the numbers in the boxes.



100 + 30 + 7 = 137 T
100 + 60 + 2 = 162 A
30 + 9 = 39 E

400 + 50 + 1 = 451 W
200 + 90 + 0 = 290 S
600 + 10 + 3 = 613 V

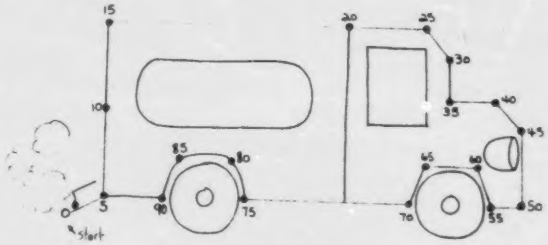
80 + 8 = 88 R
700 + 10 + 4 = 714 P
10 + 5 = 15 B

Use your answers to complete the sentence.

These are ways we can

S	A	V	E	W	A	T	E	R
290	162	613	39	451	162	137	39	88

Directions:
Follow the dots.
Count by 5 s.
Start with 0.



This can cause air pollution.

Answers: 262, 263, 264, 265

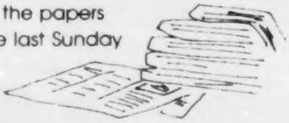
Directions:
Fill in the missing numbers on the calendar.

1980			JULY			1980
Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Use the calendar to answer the questions.

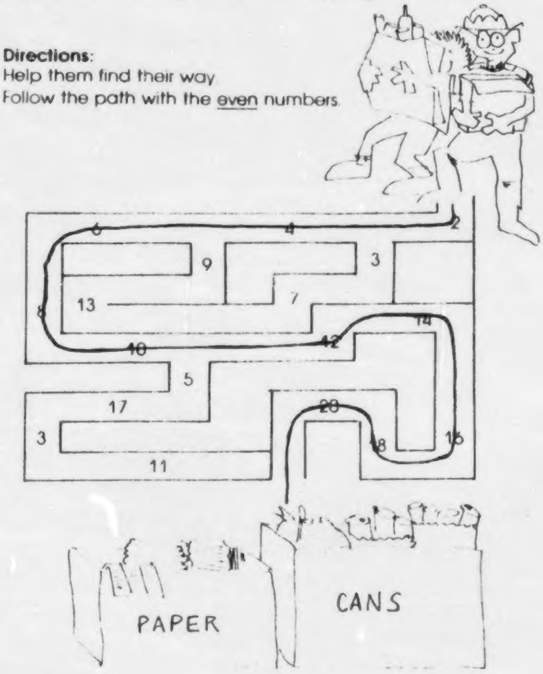
1. John is going to collect newspapers on July 9th. What day of the week is that? Wednesday
2. He is going to tie his papers together on July 14th. What day of the week is that? Monday
3. On July 19th he is going to take them to the recycling center. What day is that? Saturday
4. The recycling center takes all the papers to the paper company on the last Sunday of July. Write the date.

July 27

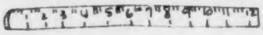
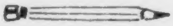
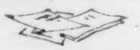
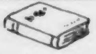
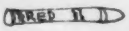
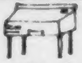


Joe and Betty are helping to save our natural resources. They are taking used cans, paper and glass to the recycling center.

Directions:
Help them find their way.
Follow the path with the even numbers.

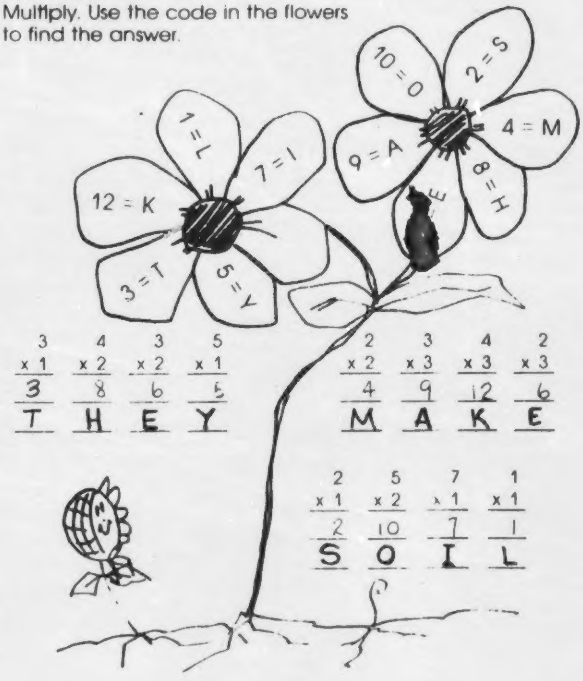


Directions:
Do the problems.
Color all the things that are made from trees.

1. Bobby had 2  s He lost 1 ruler. How many does he have left?	2 - 1 1
2. John had 3  s Mary gave him 2 more pencils. How many does he have now?	3 + 2 5
3. Susan had 6 pieces of  She used 3 of the papers. How many does she have left?	6 - 3 3
4. Timmy had 5  s. He took 1 of the books back to the library. How many does he have left?	5 - 1 4
5. Sally had 4  s. A friend gave her 2 more crayons. How many does she have in all?	4 + 2 6
6. There were 7  s in the room. Mr. Jones brought in 2 more desks. How many desks are there in the room now?	7 + 2 9

How do animals help plants?

Directions:
Multiply. Use the code in the flowers to find the answer.

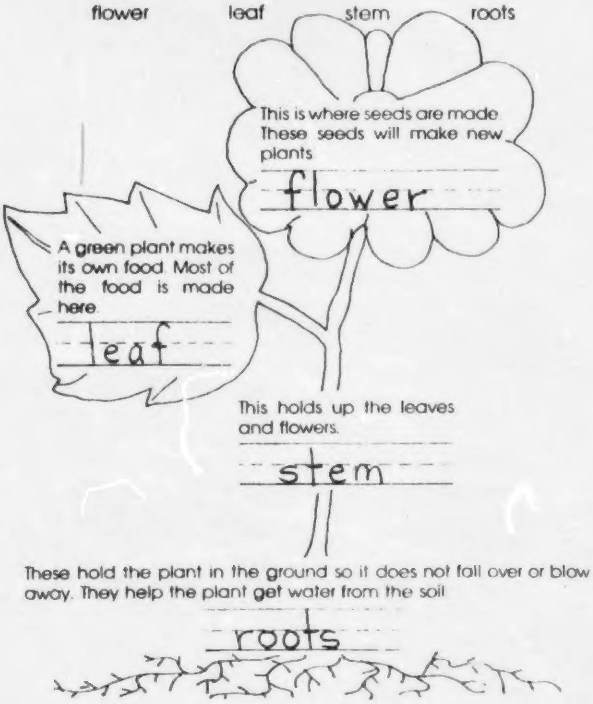


3	4	3	5	2	3	4	2
x 1	x 2	x 2	x 1	x 2	x 3	x 3	x 3
3	8	6	5	4	9	12	6
T	H	E	Y	M	A	K	E

2	5	7	1
x 1	x 2	x 1	x 1
2	10	7	1
S	O	I	L

Directions: Use these words to write the names of the parts of a plant.

flower leaf stem roots



This is where seeds are made. These seeds will make new plants.

flower

A green plant makes its own food. Most of the food is made here.

leaf

This holds up the leaves and flowers.

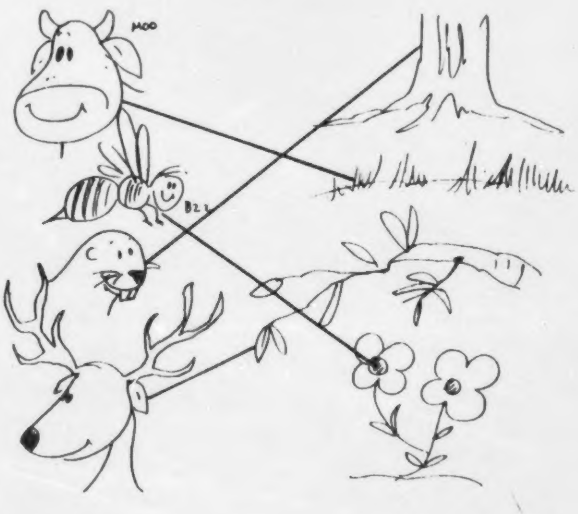
stem

These hold the plant in the ground so it does not fall over or blow away. They help the plant get water from the soil.

roots

All animals need food to grow.
Some animals eat only plants.
They eat leaves, grass, tree bark, fruit, nuts, seeds and parts of flowers.

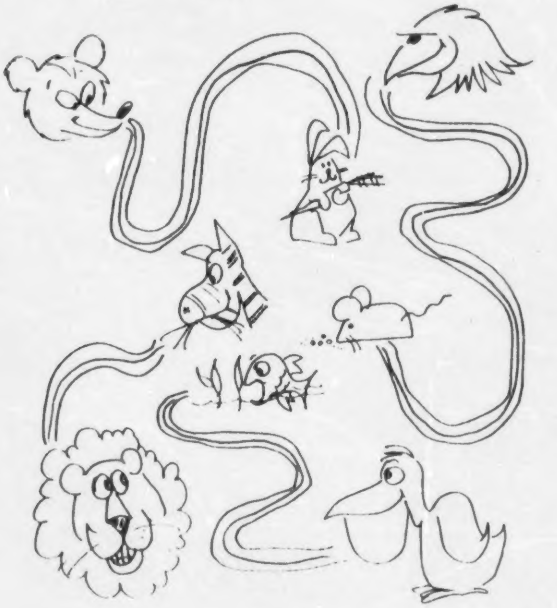
Directions: Draw a line from the animal to the part of the plant that he might eat for dinner.



What would happen to these animals if there were no plants?

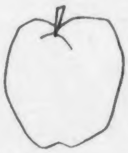
Some animals eat only meat.
Animals that eat meat have to hunt and catch their food.

Directions: Follow the trail for each animal to see what he will have for dinner.

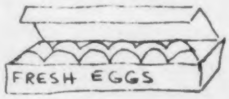


Some animals eat both plants and other animals.
People are animals that eat plants and other animals.

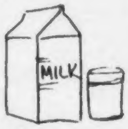
Directions: If the food comes from plants, write plant.
If the food comes from an animal that eats plants, write animal.



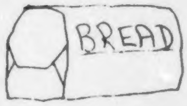
plant



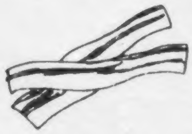
animal



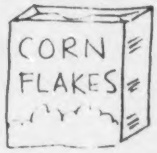
animal



plant



animal



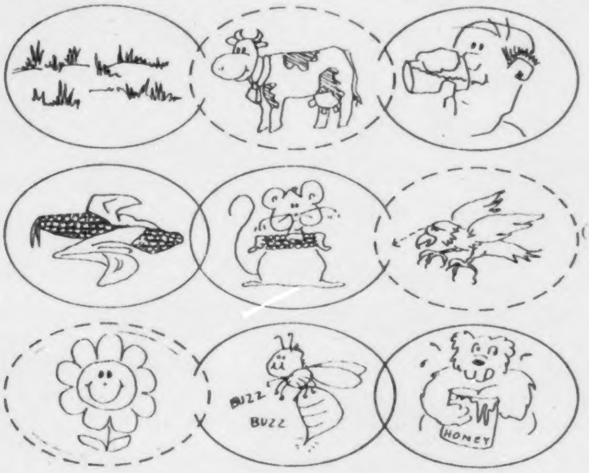
plant

Answers: 270, 271, 272, 273

Food Chains

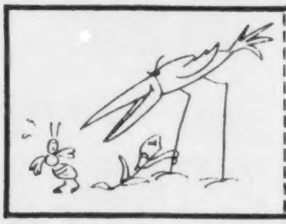
There are all kinds of food chains, but they all begin with plants.

Cut out the 'links' at the bottom of the page. Paste them in the correct places in the food chains below.

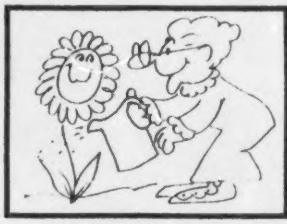


See page 276 for answer.

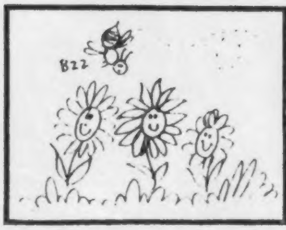
Animals help plants.



Birds eat insects that can hurt plants.



People take care of plants.



Small animals and insects spread pollen to make more plants grow.

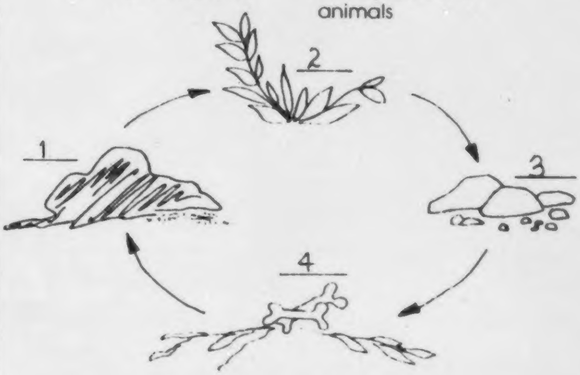
Soil is one of our natural resources.
Read the story to find out where soil comes from.

The Earth has many rocks. Sun, wind, and water break up and wear away rocks. Growing plants may break rocks too. Small bits of broken rocks become soil.

Dead plants and animals help make soil too. When plants and animals die in the soil, they become part of the soil. The dead plants and animals help new plants to grow. This is nature's way of recycling.

Directions: Put the numerals on the part of the picture that shows how soil is made.

1. soil
2. new plants
3. broken rocks
4. dead plants and animals



Answers: 274, 275, 276, 277

How do plants help soil?

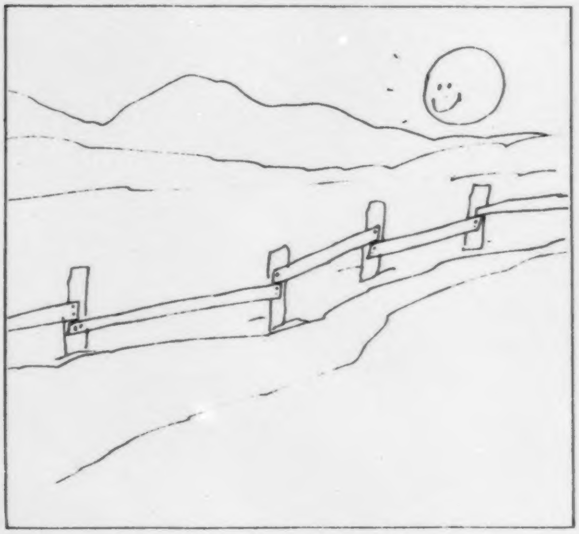
Grass and other plants hold soil together.

Plant roots grow under the ground. They hold the soil in place.

Roots keep the wind from blowing the soil away.

Roots keep water from washing the soil away.

Directions: Help save the soil in the picture by drawing trees, bushes, and other plants.



Each plant and animal has things that help it live.

Directions: Use the code to find out what these plants and animals have that helps them to live.

CODE

A	B	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	10	11	12	13
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
14	15	16	17	18	19	20	21	22	23	24	25	26

A polar bear lives in a cold place.

ITS THICK
9 20 19 20 8 9 3 11

FUR KEEPS
6 21 18 11 5 5 16 19

IT WARM.
9 20 23 1 18 13

A cactus plant lives in a dry place.

ITS LEAVES
9 20 19 12 5 1 22 5 19

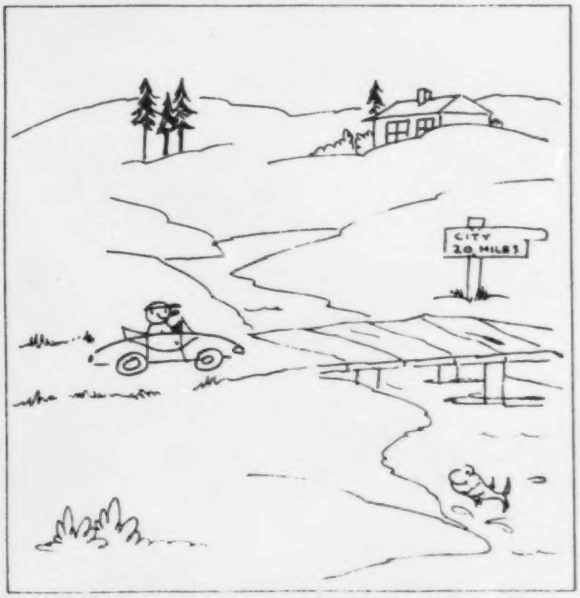
AND STEMS
1 14 4 19 20 5 13 19

HOLD EXTRA
8 15 12 4 5 24 20 18 1

WATER.
23 1 20 5 18

People live on the Earth with plants and other animals. But, people can change the Earth more than other animals can. They have hands that can build things.

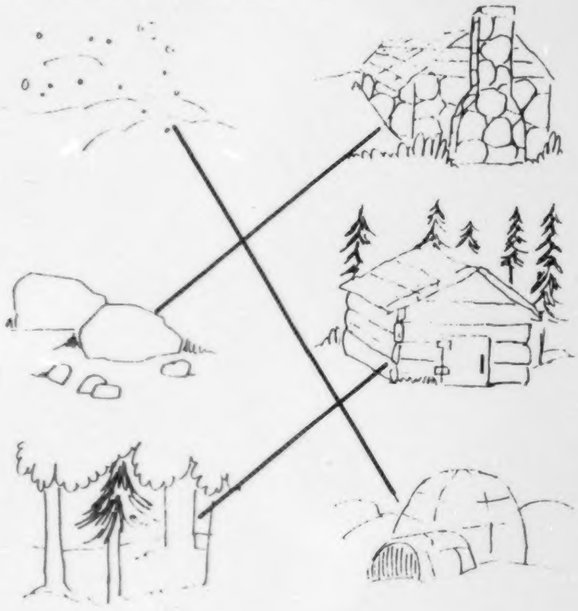
Directions: Color all the things that were built by people.



People must keep the Earth a good place for all living things.

People often build houses using the natural resources that are found where they live.

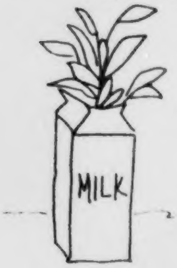
Directions: Draw a line from the house to the natural resource it is made from. Color the pictures.

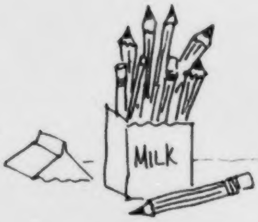


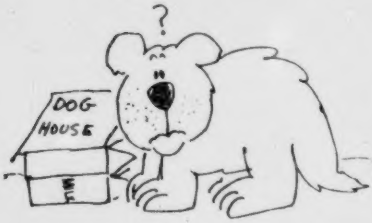
Recycling saves our natural resources. It is a way of using things and materials over again. When we recycle things, we don't need to use more of our natural resources.

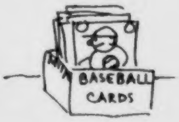
Carole is drinking milk for lunch. The milk comes in a carton that is made from paper which comes from wood. She wants to recycle the milk carton.

Directions: Color the pictures that show ways Carole could recycle the milk carton.



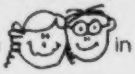
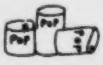
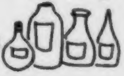
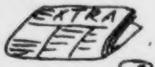


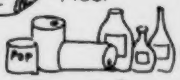
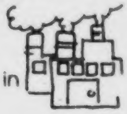
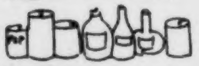


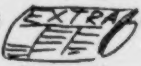
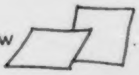


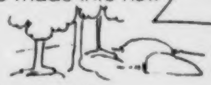
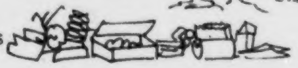
282

Directions: Use the pictures to read the story.

The  in Miss Simmons' class are saving things to be recycled. They are saving  and  and , too.

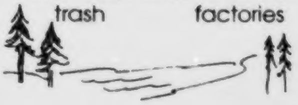
The used  can be melted in  to make new .

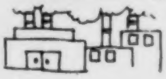
Old  can be made into new .

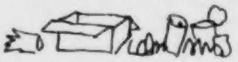
This will help to save our  and we will have less .

Write these words next to the pictures:

trash factories natural resource


natural resource

factories



trash

283

Here are some ways you can help to save our natural resources.

Directions: Write yes in front of the ways that will help.
Write no in front of the ways that will not help.

SAVE OUR RESOURCES
SAVE
WOOF

WAYS TO SAVE OUR NATURAL RESOURCES

yes	Use both sides of writing papers.
no	Always use paper cups and plates.
yes	Turn off lights you are not using.
no	Throw books away after you have read them.
yes	Turn off water you are not using.
yes	Recycle as many things as you can.

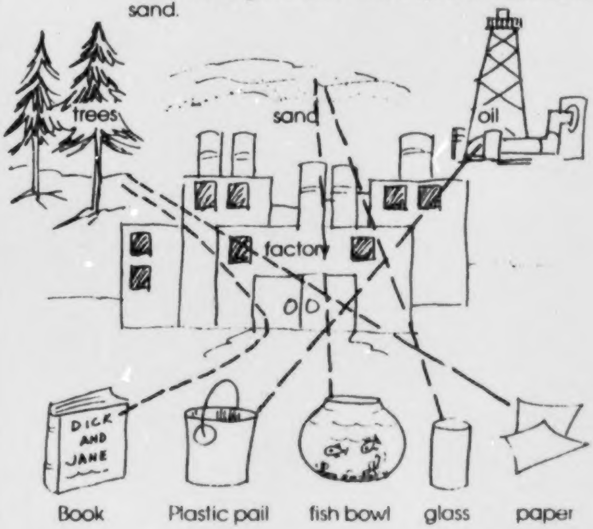
284

We get many things from our natural resources. Some of these things are made in factories.

Directions: Draw a line from the things we use back to the natural resource that it comes from. Be sure to go through the factory.

Use a black crayon if the object is made from oil.
Use a green crayon if the object is made from wood.

Use an orange crayon if the object is made from sand.

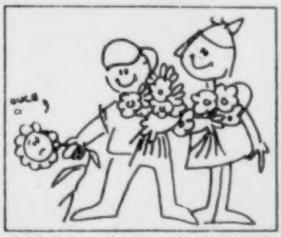


285

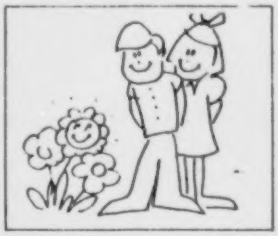
Answers: 282, 283, 284, 285

Directions: Choose an ending for each story. Color it.

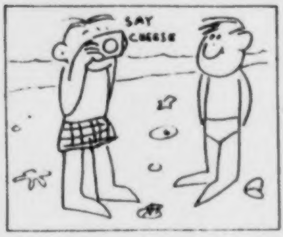
Mary and Jim went for a walk in the forest. There were many pretty flowers growing by the path.



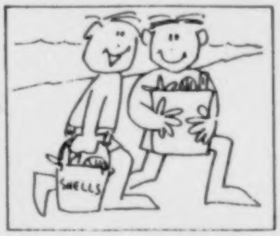
or



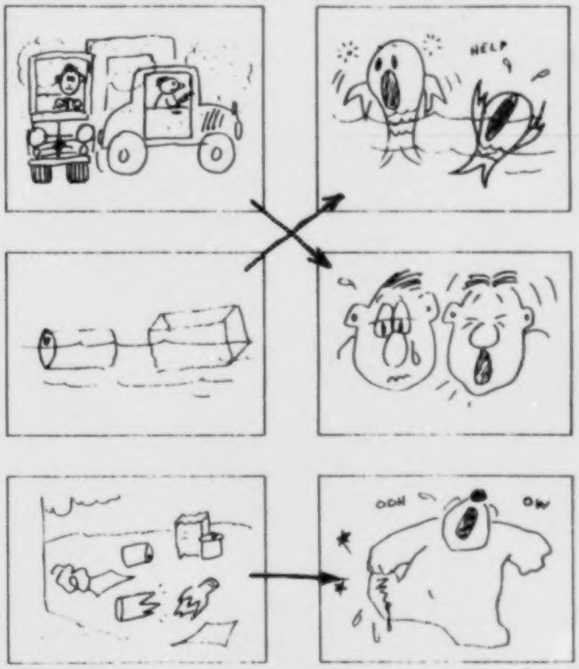
Matt and Mike went to the beach. They saw many shells, starfish and other little animals.



or

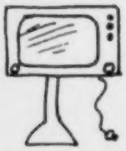


Directions: Draw a line from each picture to the one that shows what could happen next.

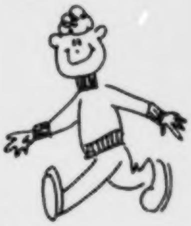


Conservation: to save from waste or loss of resources.

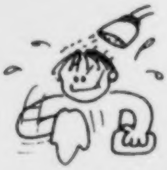
Here are ways to conserve our natural resources.
Put an "X" on the things you do.



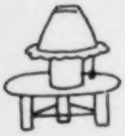
Turn off TV when not watching



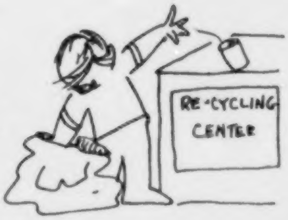
Walk when you can



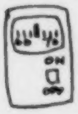
Hurry in the shower



Turn off lights


RE-CYCLING CENTER

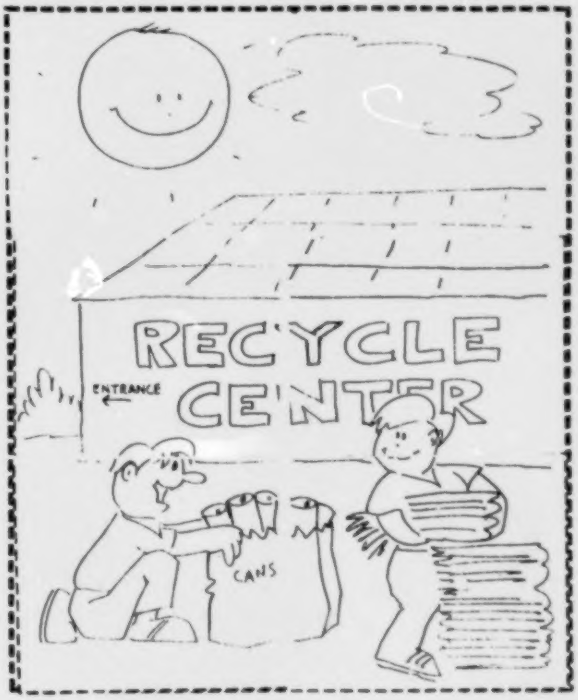
Use things again



Keep your heat down

Here is one way to save our natural resources.

Directions: Cut out the pieces. Put the puzzle together.


RECYCLE CENTER
ENTRANCE
CANS

CONSERVATION FOR CHILDREN

Criterion Referenced Test (2)

Name ______________________

Date ______________________

DIRECTIONS: Read the questions.
Write your answers on the blank spaces.

1. Write the name of a plant or animal that lives in each of these habitats.

The ocean *fish, shark, seaweed, whale, crab, octopus, kelp, etc.*

The forest *bear, rabbit, squirrel, deer, fox, pine tree, firs, moss, etc.*

The desert *snake, tortoise, cactus, lizard, camel, etc.*

The pond *frogs, duck, fish, algae, lily pads, polliwogs, etc.*

The city *dog, cat, people, pigeons, mice, etc.*

2. What do all food chains begin with? *PLANTS*

3. Name something animals do for plants.

Help make soil, provide CO2, some insects and birds eat bugs that harm plants.

4. Name something plants do for animals.

Provide food, provide materials for shelter (buildings), give off oxygen into the air, materials for clothing,

5. What does 'recycle' mean?

To use things and materials over again.

6. Write the names of five natural resources.

1. WATER
2. AIR
3. MINERALS (Also people, forests, wildlife, etc.
4. SUN
5. SOIL

7. What is paper made from? WOOD (trees)

8. What is glass made from? SAND

9. What is plastic made from? OIL

10. Write the names of two things that cause air pollution.

cars (exhaust) forest fires , smoking, factories (emissions)

11. Write the names of two things that make the water polluted.

trash, garbage, oil, cans, sewage

12. Write two things you can do to make our environment cleaner.

Pick up litter, recycle when you can, walk instead of riding in a car, ride a bike, etc.

Level 3

Conservation For Children

This activity guide is the third in a series of six grade level sequenced guides.

It has been developed to promote conservation awareness, understanding and action for elementary school children.

An ESEA Title IV-C Project, Number 6298

Produced by Cupertino Union School District

John Muir Elementary School
6560 Hanover Drive
San Jose, CA 95129

(408) 252-5265

Carl W. Krause, Superintendent

Board of Education

Robert D. Hall, President
Severene Bylin
Roger C. Halstead
Valerie Harrison
Claire Hobbs

PROJECT STAFF

State Consultant: William A. Johnson

Associate Superintendent: William Zachmeier

Project Administrator, Principal: Rex Wetzel

Director: Marilyn Bodourian

Program Clerks: Carole Kumaishi
Alice Ruick

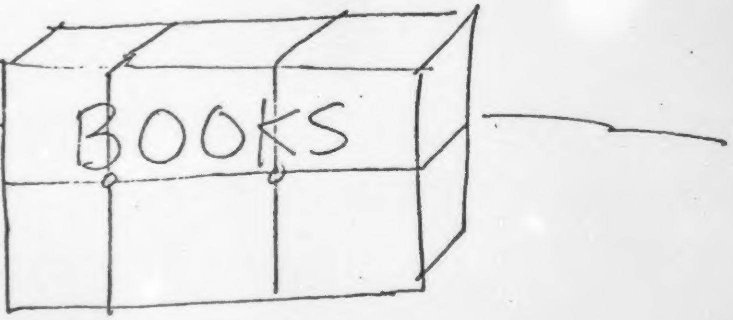
Illustrator: Gen McKenzie

Evaluators: Lynn Fossum
Eloise Martin Appel

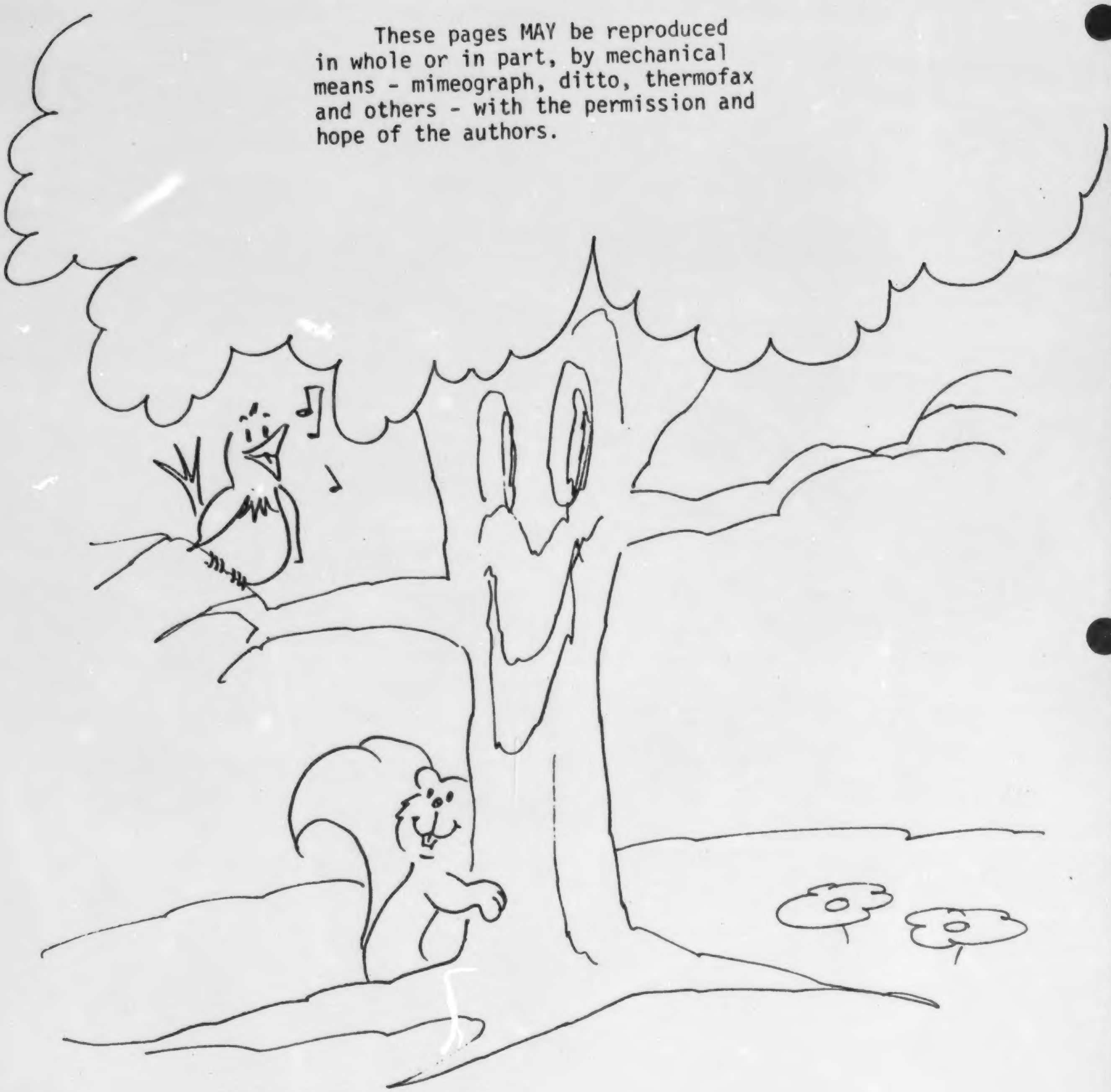
Consultants: Environmental Volunteers
Jane Hall

Special thanks to the following project teachers and their students who were willing to participate in the development, field testing, and evaluation of the materials. This project would not have been possible without their valuable assistance.

DeNice Parker
Jackie Keller
Virginia Feldner
Marcia Richards
Sharon Caputo
Thelma Meaders



These pages MAY be reproduced in whole or in part, by mechanical means - mimeograph, ditto, thermofax and others - with the permission and hope of the authors.



The pages in this book are printed on 100% recycled paper.

TABLE OF CONTENTS

PART 1

Introduction
Purpose, contents, how to use the materials 300

Conservation Concepts .302

Criterion Referenced Test 303

Test Worksheet Correlation 305

Content Guide 306

PART 2

Student Worksheets

Language Arts 310

Mathematics 350

Social Studies, Science 370

Related Activities 390

APPENDIX

Answers
Student Worksheets
Criterion Referenced Test

INTRODUCTION

PURPOSE:

The CONSERVATION FOR CHILDREN materials were developed to enable teachers to provide relevant conservation information for students in an easy and practical manner.

As our natural resources decline, both in quality and quantity, the importance of conservation education cannot be understated. As children become aware of environmental problems, they can better understand the precedents and consequences of such and their interdependency with the environment. This knowledge will hopefully lead to positive action.

CONTENTS:

Each grade level guide includes:

1. Conservation Concepts -

   These grade level concepts have been determined by teachers to meet the basic interests of students and to correlate with other grade level subject matter.

2. Criterion Referenced Test -

   A student test designed to measure pre and post knowledge of the grade level conservation concepts.

3. Class Record Sheet -

   A recording sheet for teacher use in programming instruction. This page also correlates the test items and student worksheets.

4. Content Guide -

   The guide correlates accepted basic skill objectives and conservation topics. The listing of student worksheets includes

forty pages of language arts activities, twenty pages of mathematics, twenty pages of social studies and science, and ten pages of related activities.

5. Student Worksheets -

   Ninety worksheets which integrate basic skills objectives and conservation information. The worksheet pages were planned and developed by students and teachers and are intended for duplication. They are readily usable in the classroom and require no additional materials, time or space. These worksheets were designed to be relevant, motivating and fun for children.

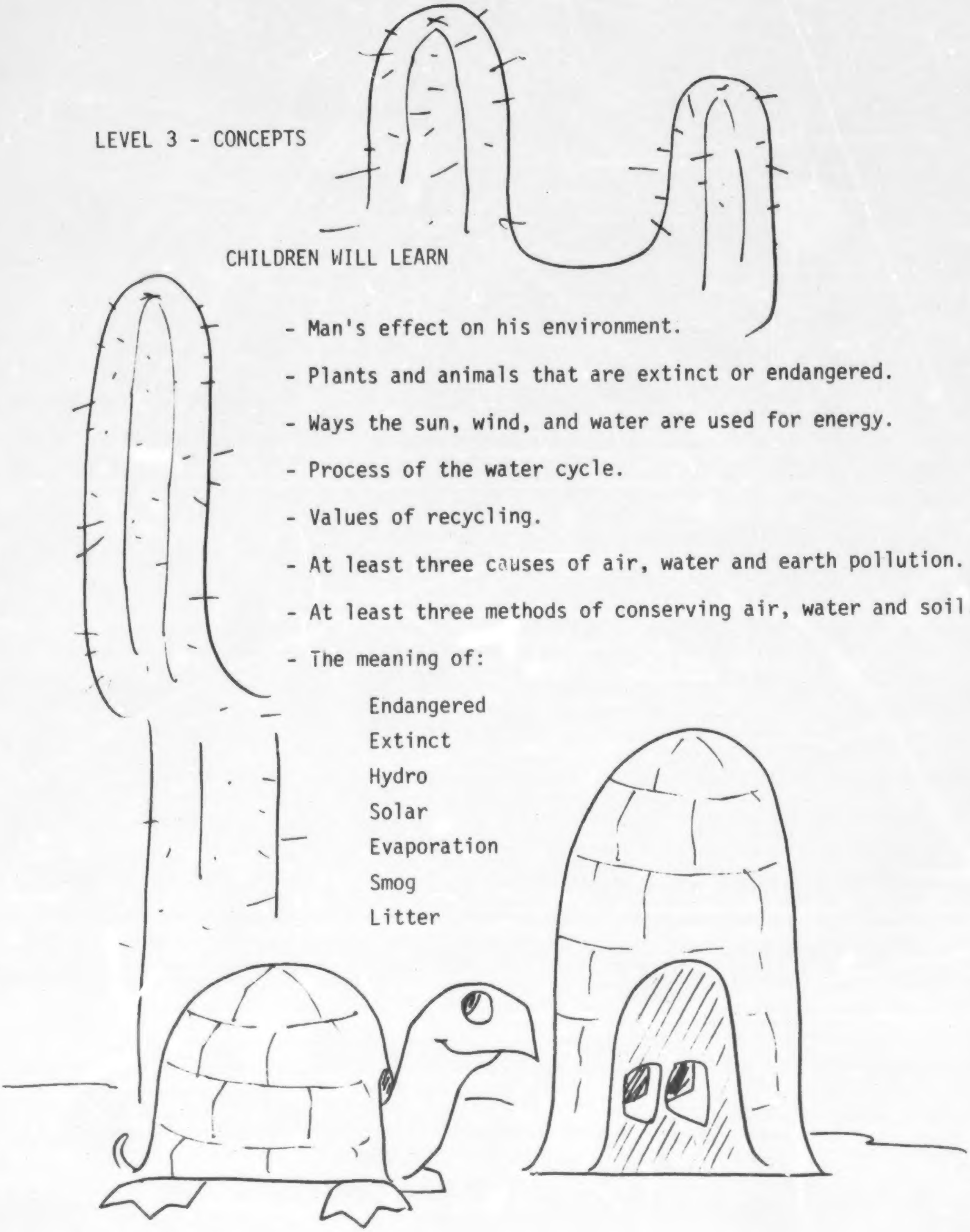
USING THE MATERIALS:

The CONSERVATION FOR CHILDREN materials may be used as a primary resource for teaching basic skills, as supplementary materials to a core program, as enrichment activities, skill review, or as a unit of study.

The worksheets have purposefully not been sequenced or arranged in any order, other than subject area, to encourage teachers to pick and choose those that will meet the needs of their students. Teachers may use the content guide to identify basic skills and/or conservation topics for each worksheet. Conservation concepts are covered in each basic skill area and apre presented in several worksheets with varying degrees of difficulty. Each worksheet is independent of the others.

The criterion referenced test is included for teachers who want to assess student growth in conservation knowledge. Recording pretest results on the class record sheet will enable teachers to program the materials to meet individual and group needs.

LEVEL 3 - CONCEPTS



CHILDREN WILL LEARN

- Man's effect on his environment.
- Plants and animals that are extinct or endangered.
- Ways the sun, wind, and water are used for energy.
- Process of the water cycle.
- Values of recycling.
- At least three causes of air, water and earth pollution.
- At least three methods of conserving air, water and soil.
- The meaning of:

    Endangered
    Extinct
    Hydro
    Solar
    Evaporation
    Smog
    Litter

CONSERVATION FOR CHILDREN
Criterion Referenced Test (3)

Name ______________________________

Date ______________________________

DIRECTIONS: Read the questions. Write your answers on the blank spaces.

1. List three things people have done that have changed our environment.

   1. ____

   2. ____

   3. ____

2. Write the names of three animals that are 'endangered'.

   1. ____________________ 3. ____________________

   2. ____________________

3. Write the names of two animals that are 'extinct'.

   1. ____________________ 2. ____________________

4. What are the three main reasons for recycling things?

   1. ____

   2. ____

   3. ____

5. What were the first three sources of energy used by people?

   1. ____________________ 3. ____________________

   2. ____________________

270

6. Complete these sentences with the correct words.

   1. Energy from the sun is called ______________ power.

   2. Our most important natural resource is ______________.

   3. Hydro power comes from ______________.

7. Write four parts of the water cycle.

   1. ______________ 3. ______________

   2. ______________ 4. ______________

8. List three causes of air pollution.

   1. ______________

   2. ______________

   3. ______________

9. List three causes of water pollution.

   1. ______________

   2. ______________

   3. ______________

10. Write three things you can do to make our environment cleaner.

   1. ______________

   2. ______________

   3. ______________

CONSERVATION FOR CHILDREN

Class Record Sheet
Criterion Referenced Test - Grade 3

Question #	No. right on Pre-Test	No. right on Post-Test	Student Worksheets
1. Write three things people have done that have changed the environment.			310, 313, 316, 354 367, 382, 384, 385
2. Write the names of three animals that are 'endangered'.			317, 322, 325, 339 343, 376, 388
3. Write the names of two animals that are 'extinct'.			325, 342, 364, 366 377, 388
4. What are the three main reasons for recycling things?			311, 312, 318, 326 330, 347, 355, 358 360, 381
5. What were the first three sources of energy used by people?			337, 346, 361, 365 370, 373
6. Complete these sentences with the correct words. 1. Energy from the sun is called ______ power.			319, 328, 333, 334 346, 371
2. Our most important natural resource is ____________.			315, 335, 345, 369 375
3. Hydro power comes from ______________ .			319, 333, 346, 372 375
7. Write four parts of the water cycle.			315, 328, 363, 374
8. List three causes of air pollution.			324, 329, 331, 333 339, 341, 359, 386 387, 388
9. List three causes of water pollution.			323, 324, 331, 348
10. Write three things you can do to make our environment cleaner.			318, 321, 331, 333 336, 340, 349, 351 352, 353, 360, 368 383, 387, 389

Page No.	Skill	Conservation Topic	District Curriculum
Language Arts			
310	Literal comprehension	Wildflowers	
311	Literal comprehension	Recycling paper	
312	Literal comprehension	Recycling	
313	Literal comprehension	Man's effect, animals	
314	Literal comprehension	Natural resources	
315	Title selection	Water	
316	Topic sentences, editing	Man's effect, plants	
317	Literal comprehension	Endangered animals	
318	Sentence completion	Conservation methods	
319	Vocabulary development	Vocabulary	
320	Interpreting TV schedule	General	
321	Common nouns	Conservation methods	
322	Alphabetical order	Endangered animals	
323	Following directions	Water pollution	
324	Sentences, complete, inc.	General	
325	Use of symbols	Endangered animals	
326	Vocabulary development	Products, recycling	
327	Table of Contents	Water	
328	Diagrams, labeling	Water cycle	
329	Spelling	Pollution causes	
330	Subject, predicate	Recycling	
331	Spelling, silent e	Pollution	
332	Spelling	Vocabulary	

Page No.	Skill	Conservation Topic	District Curriculum
333	Capitalization	General	
334	Parts of a letter	Solar energy	
335	Punctuation	Water	
336	Contractions	Water conservation	
337	Syllables	Energy, water and wind	
338	Compound words	General	
339	Homonyms	General	
340	Synonyms	Conservation methods	
341	Vocabulary development	Air pollution	
342	Antonyms	General	
343	Spelling	Endangered animals	
344	Alphabetical order	Vocabulary	
345	Alphabet, sequence	Water, sun	
346	Verb, subject agreement	Energy, sun, wind, water	
347	Verb usage	Recycling paper	
348	Rhyming words	General	
349	Fact or fantasy	Conservation methods	
Math			
350	Graphs	General	
351	Multiplying, 1 digit	Litter	
352	Multiplying, word problems	Recycling	
353	Telling time	Recycling	
354	Ordinal numbers	Endangered animals	
355	Addition, word problems	Recycling	

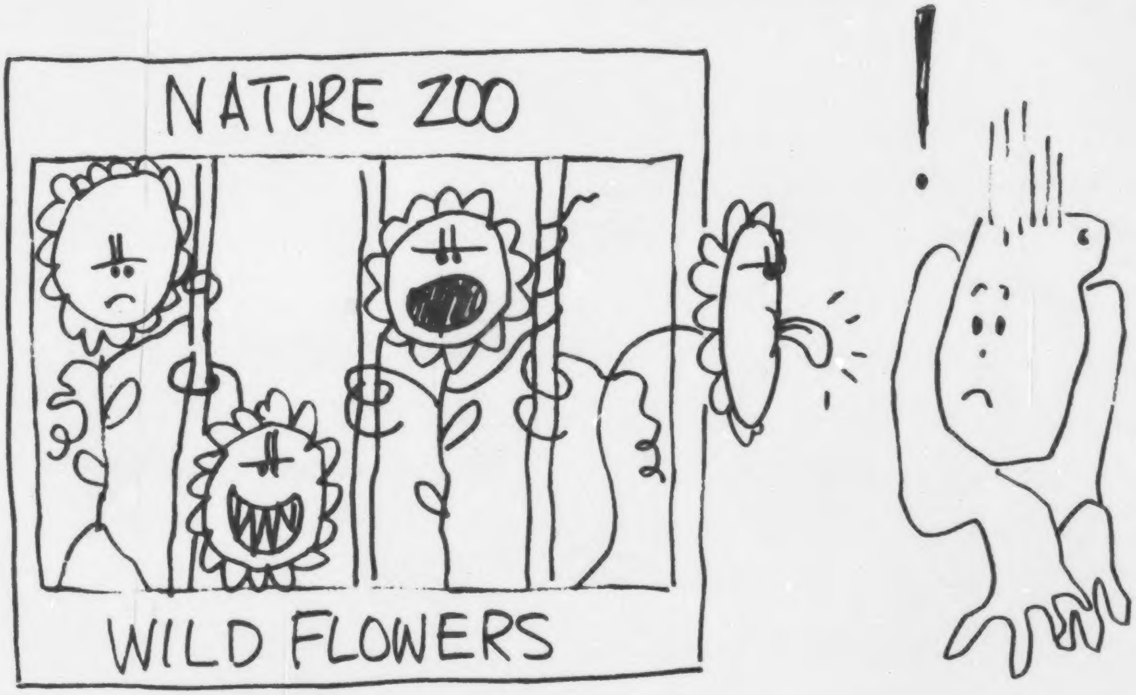
Page No.	Skill	Conservation Topic	District Curriculum
356	Addition, 3 column	Animals, use by man	
357	Multiplying, word problems	Water usage	
358	Number sentences	Recycling	
359	Number sentences	Air pollution	
360	Expanded notation	Recycling	
361	Odd-even numbers	Sources of energy	
362	Word problems, analysis	Animals	
363	Geometric shapes	Water cycle	
364	Expanded notation	Extinct animals	
365	Counting by 3's	Wind power	
366	Addition, 3 column	Extinct animals	
367	Roman numerals	Animals, man's effect	
368	Expanded notation	Recycling	
369	Number patterns	Natural resources	
Social Studies/Science			
370	Interpretive comprehension	Sources of energy	
371	Interpretive comprehension	Solar energy	
372	Interpretive comprehension	Hydro power	
373	Rebus puzzle	Three kinds of energy	
374	Sentence completion	Water cycle	
375	Spelling	Water	
376	Identification	Endangered animals	
377	Literal comprehension	Extinct animals	
378	Following directions	Adaptation	

Page No.	Skill	Conservation Topic	District Curriculum
379	Classification	Time and energy	
380	Resources, book titles	General	
381	Decoding	Natural resources	
382	Interpretive comprehension	Forest fires	
383	Interpretive comprehension	Environmental laws	
384	Map directions	Changes in the environment	
385	" " (2 pages)	" " " "	
386	Classification	Air pollution	
387	Interpretive comprehension	Conservation methods	
388	Categorizing	Vocabulary	
389	Record keeping	Conservation methods	

Related Activities

390	Introduction		
391	Arts and Crafts	Rock Animals	
392	Arts and Crafts	Making Recycled Paper	
393	Arts and Crafts	Paper Bag Masks	
394	Growing Plants	Fruit seeds	
395	Growing Plants	Tin can gardening	
396	Music	"It's a Small World"	
397	Send Aways	Conservation Information	
398	Send Aways	Conservation Information	
399	Student Bibliography	Conservation books, fact and fiction	

Name ______________________



Directions: Read the story then answer the question below.

Wild flowers are a pretty part of our countryside. They help to make our land more beautiful.

There are many places, especially near our cities, where wild flowers no longer grow. They have been picked and uprooted and stepped upon until they are gone. Many areas where they grew have been changed to make room for homes, shopping centers, and roads.

Lots of people are concerned that there aren't as many wild flowers growing anymore.

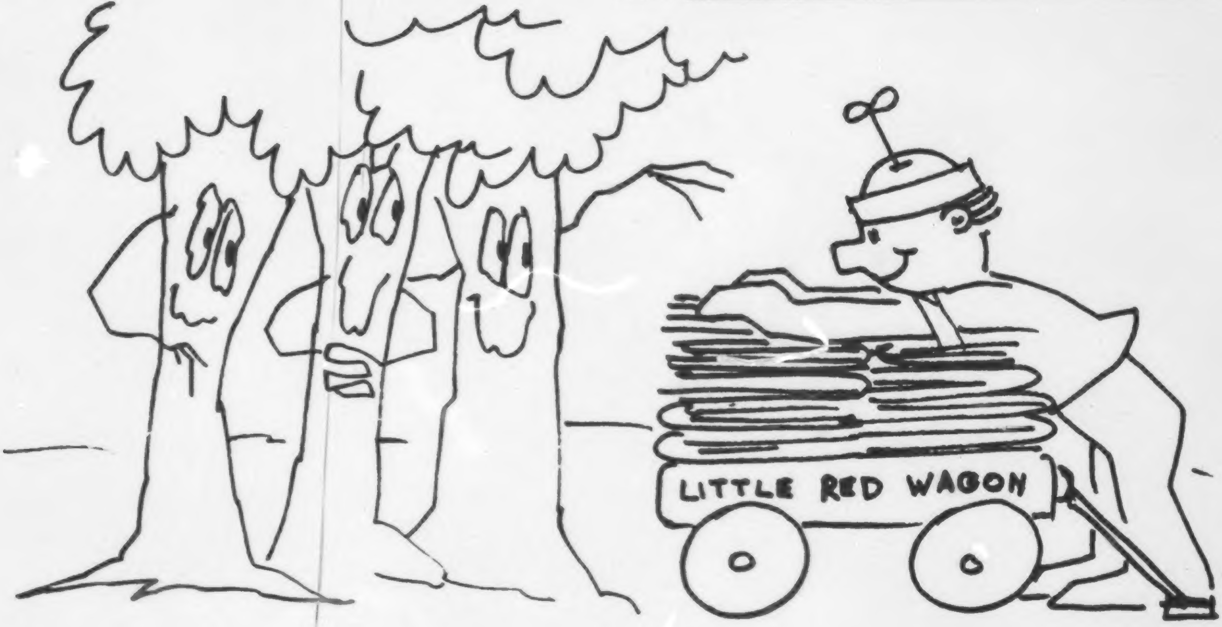
Can you think of some ways to save our wild flowers?

1. ______________________

2. ______________________

3. ______________________

Name ______________________________



Wood pulp is the main material used to make paper. If used paper is chopped up and remade into new paper, fewer trees will have to be cut. This is called recycling paper. Recycling is a great help in saving our forests. By saving your newspapers and bringing them to be recycled, you will help to save our trees.

Directions: Fill in the blank spaces with the correct words.

1. Recycling paper saves ______________.
2. A large group of trees is called a _________________.
3. When paper is chopped up to make paper, it is called ______________.
4. Using old paper to make new paper is called ______________________.
5. You can save trees by recycling ____________________.

paper pulp forest trees recycling

Name ______________________________

Directions: Read the story then answer the question below.

RECYCLING

Recycling means the reuse of materials that we have thrown away after using them in their original form. We can recycle glass, aluminum, tin, paper and many other materials. Recycling can mean shredding old cans and cars and melting the pieces to make new metal for new cans and new cars. It can also mean crushing bottles into tiny glass bits and melting these bits to make new glass. Lots of materials can be recycled.

There are two main reasons for recycling materials. First, America is running out of raw materials to make new products. By using the same materials over and over again, we save our natural resources.

The second reason why we should recycle materials is to get rid of our growing piles of trash. When we throw used bottles and cans away, they become trash. Since there are more people in America today, there is also lots more trash. Getting rid of all the trash is one of our biggest problems. By recycling we reuse our trash instead of having to get rid of it. This solves part of our problem of what to do with the trash.

Why is it important to recycle materials?

1. ______________________________

____

____

____

2. ______________________________

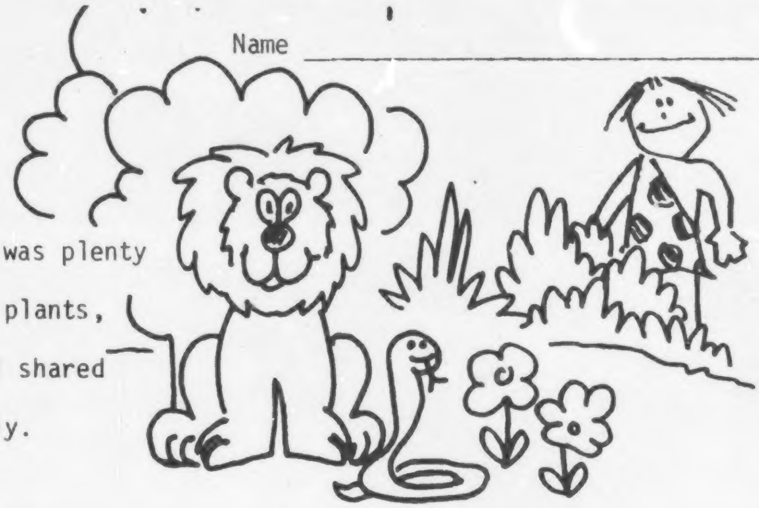
____

____

____

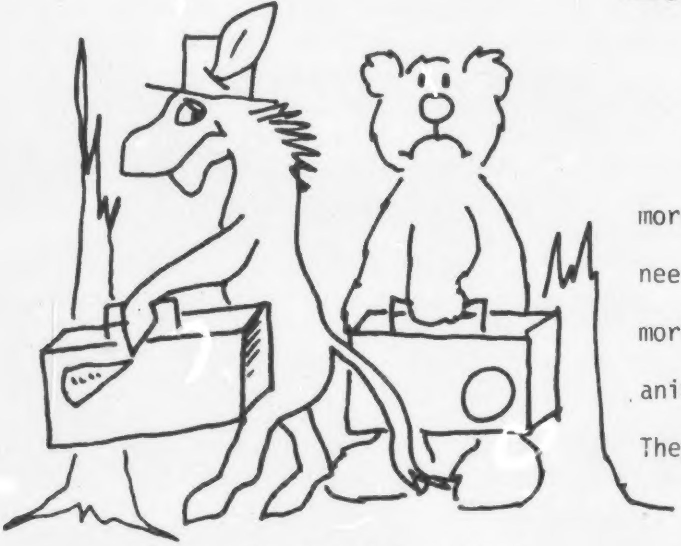
____

Name ______________________________

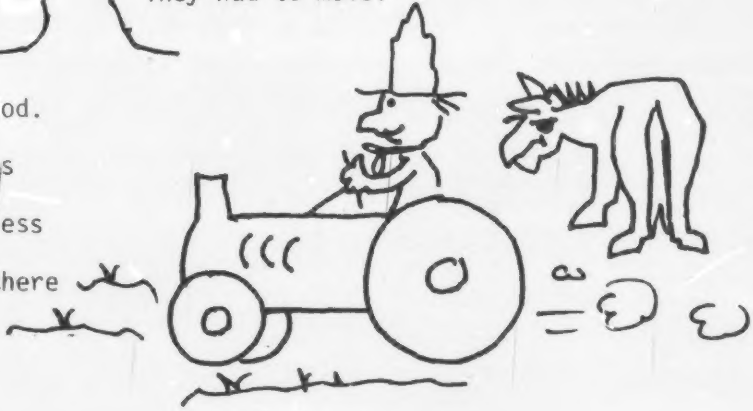


Read The Story

Once upon a time, there was plenty of room on Earth for all the plants, animals and people. They all shared their environments very nicely.



As years went by, there were more and more people. More people needed more homes. To build them, more trees were cut down. Wild animals also used the trees for homes. They had to move.



More people needed more food. To grow more food, more land was needed. The wild animals had less and less room and food. Soon there were fewer wild animals.

Answer The Questions

1. People cut down trees to build ______________________.
2. They needed more land to grow ______________________.
3. The wild animals had less and less ______________________ and ______________.
4. There were fewer wild ______________________.

Name ______________________________

All of the things we use every day come from some kind of natural resource. Natural resources are materials supplied to us by nature, such as coal, oil, water, rich soil, trees and other plants.

Look around your room. Do you know what natural materials were used to make paper, pencils and wooden furniture? Window glass and light bulbs are made from sand. Most metal things, such as scissors, pins and waste baskets are made from ores in the ground.

What are the plastic things made from?

Follow the directions to find out.

Draw a circle around every set of four numbers that are in order, such as 2, 3, 4, 5 or 6, 7, 8, 9. The numbers are always in a straight line and go up, down or across.

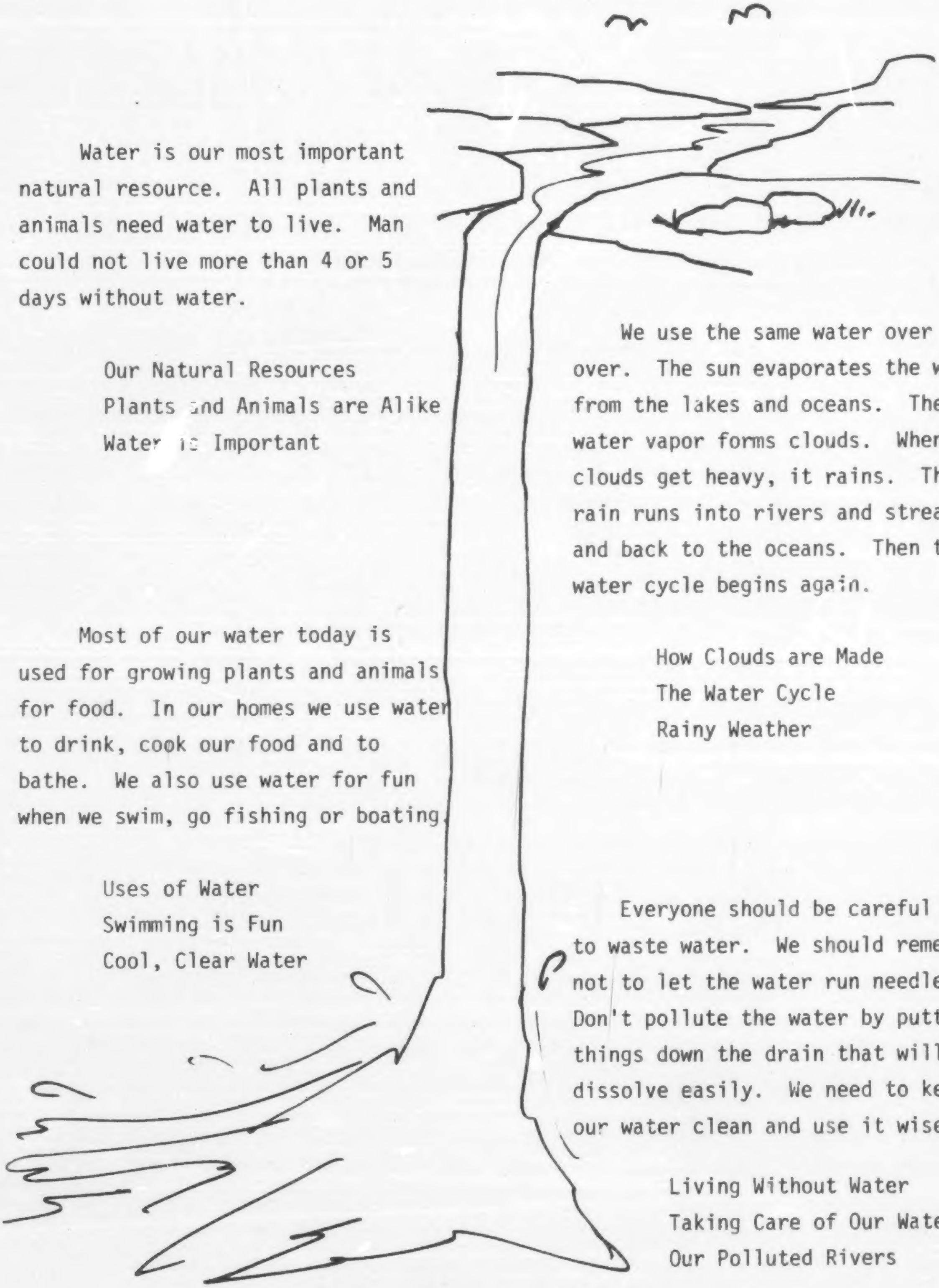
6	7	3	8	6	8	1	2	5	1	6	3	2	8
9	2	3	4	5	3	5	6	8	9	1	8	4	6
1	3	6	2	6	7	9	7	2	4	2	7	7	1
8	4	1	3	7	1	3	8	2	6	3	5	2	3
2	5	6	7	8	5	1	9	4	7	4	5	6	7
7	2	9	4	3	6	4	3	5	1	8	6	9	6

Write the correct answers.

1. Paper is made from (plastic, wood) ____________________.
2. Oil is used to make (plastic, trees) ____________________.
3. Most glass is made from (oil, sand) ____________________.
4. Natural resources are materials supplied by (man, nature) ______________.

Name ____________________

Directions: Read each story. Choose the best title and draw a line under it.



Water is our most important natural resource. All plants and animals need water to live. Man could not live more than 4 or 5 days without water.

Our Natural Resources
Plants and Animals are Alike
Water is Important

Most of our water today is used for growing plants and animals for food. In our homes we use water to drink, cook our food and to bathe. We also use water for fun when we swim, go fishing or boating.

Uses of Water
Swimming is Fun
Cool, Clear Water

We use the same water over and over. The sun evaporates the water from the lakes and oceans. The water vapor forms clouds. When the clouds get heavy, it rains. The rain runs into rivers and streams and back to the oceans. Then the water cycle begins again.

How Clouds are Made
The Water Cycle
Rainy Weather

Everyone should be careful not to waste water. We should remember not to let the water run needlessly. Don't pollute the water by putting things down the drain that will not dissolve easily. We need to keep our water clean and use it wisely.

Living Without Water
Taking Care of Our Water
Our Polluted Rivers

Name ______________________________

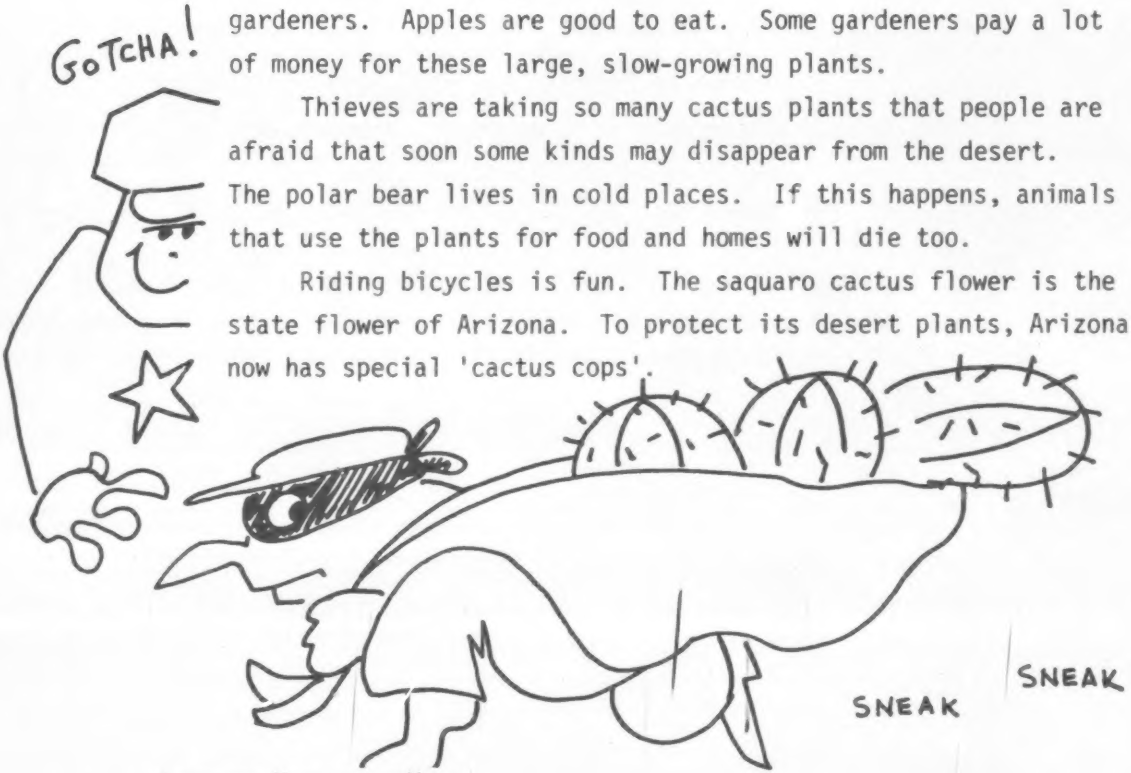
Directions: Read the story. Draw a line through the sentences that do not belong in the story.

Cactus Cops

Police in Arizona often chase a different kind of thief. They look for people who steal cactus plants and sell them to gardeners. Apples are good to eat. Some gardeners pay a lot of money for these large, slow-growing plants.

Thieves are taking so many cactus plants that people are afraid that soon some kinds may disappear from the desert. The polar bear lives in cold places. If this happens, animals that use the plants for food and homes will die too.

Riding bicycles is fun. The saguaro cactus flower is the state flower of Arizona. To protect its desert plants, Arizona now has special 'cactus cops'.



Answer the question.

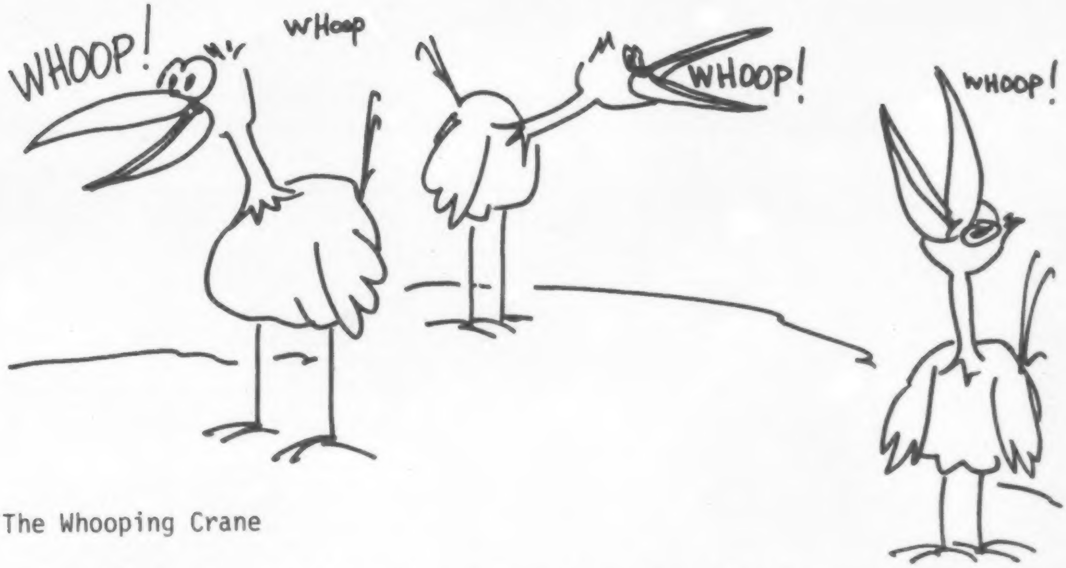
What will happen if the cactus plants disappear from the desert?

____

____

____

Name ______________________________


WHOOP!
WHoop
WHOOP!
WHOOP!

The Whooping Crane

The whooping crane is an endangered species. Thirty years ago there were only 21 whooping cranes alive in the world. Today the number has grown to 99. Some people who cared about the whooping crane got laws passed to protect the cranes' winter home in Texas. They also began taking some eggs from the wild cranes and raising the baby chicks.

Whooping cranes usually lay two eggs at a time, but only one chick grows up. The babies fight, and the stronger chick steals the food from the weaker one. To stop this, scientists keep baby cranes in pens with baby turkeys. During fights, the turkeys can outrun the cranes and they don't get hurt. Sometimes scientists put whooping crane eggs into the nests of other birds. These different birds will raise the baby whooping cranes as their own.

People who care may be able to save the whooping crane from becoming extinct.

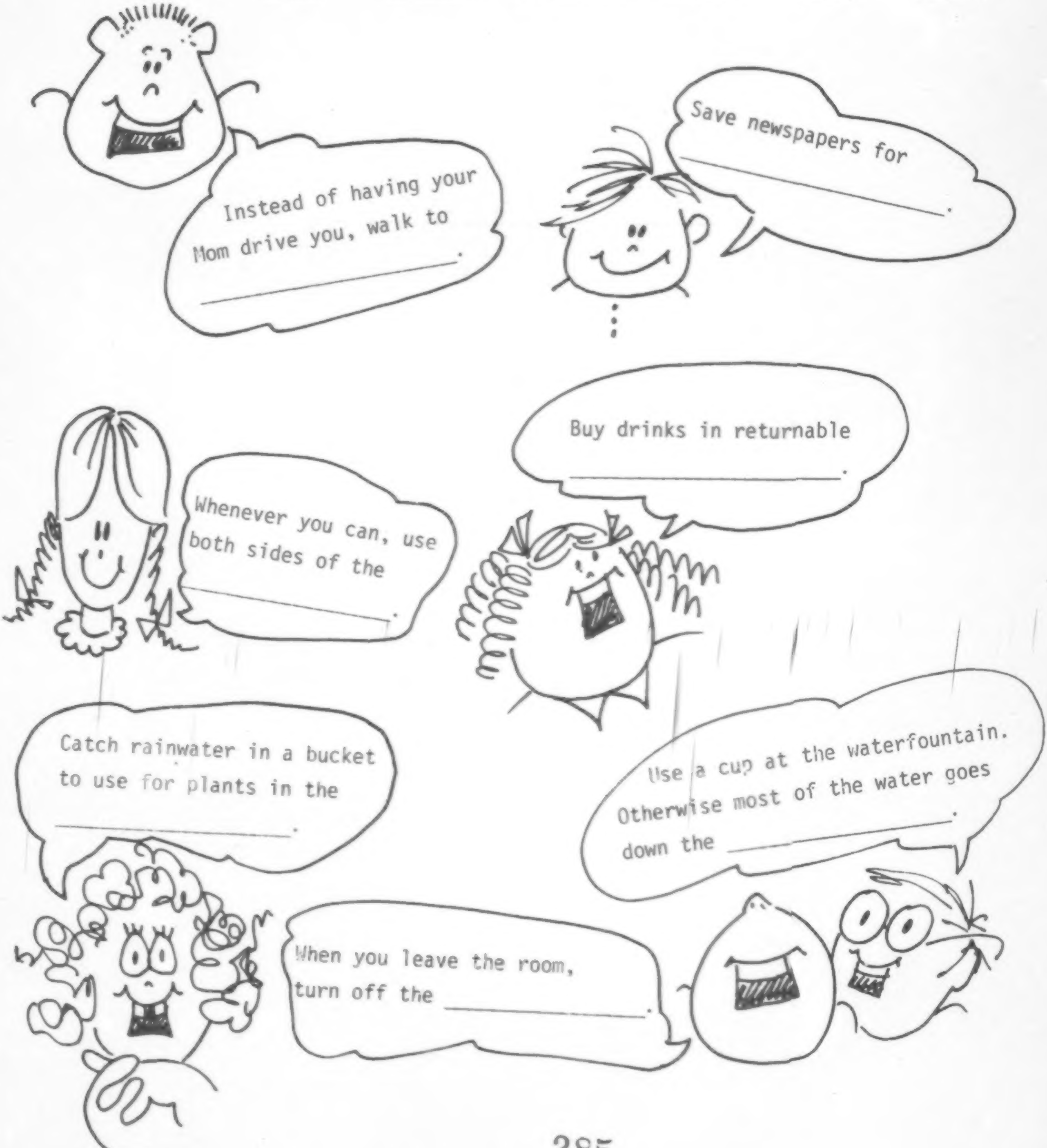
Write "yes" or "no" after each sentence.

1. The whooping crane is an endangered species. ______________
2. The cranes' winter home is in California. ____________
3. Sometimes whooping crane chicks are raised with turkeys. ____________
4. Whooping cranes got laws passed to protect their winter homes. ____________
5. There are more whooping cranes alive today than 30 years ago. ____________

Name ______________________________

Directions: These students have thought of ideas on how to save energy and stop waste. The last word of each idea is missing. Use the following words to complete the sentences.

drain paper bottles recycling lights house school


Instead of having your Mom drive you, walk to ______________.
Save newspapers for ______________.
Buy drinks in returnable ______________.
Whenever you can, use both sides of the ______________.
Catch rainwater in a bucket to use for plants in the ______________.
Use a cup at the waterfountain. Otherwise most of the water goes down the ______________.
When you leave the room, turn off the ______________.

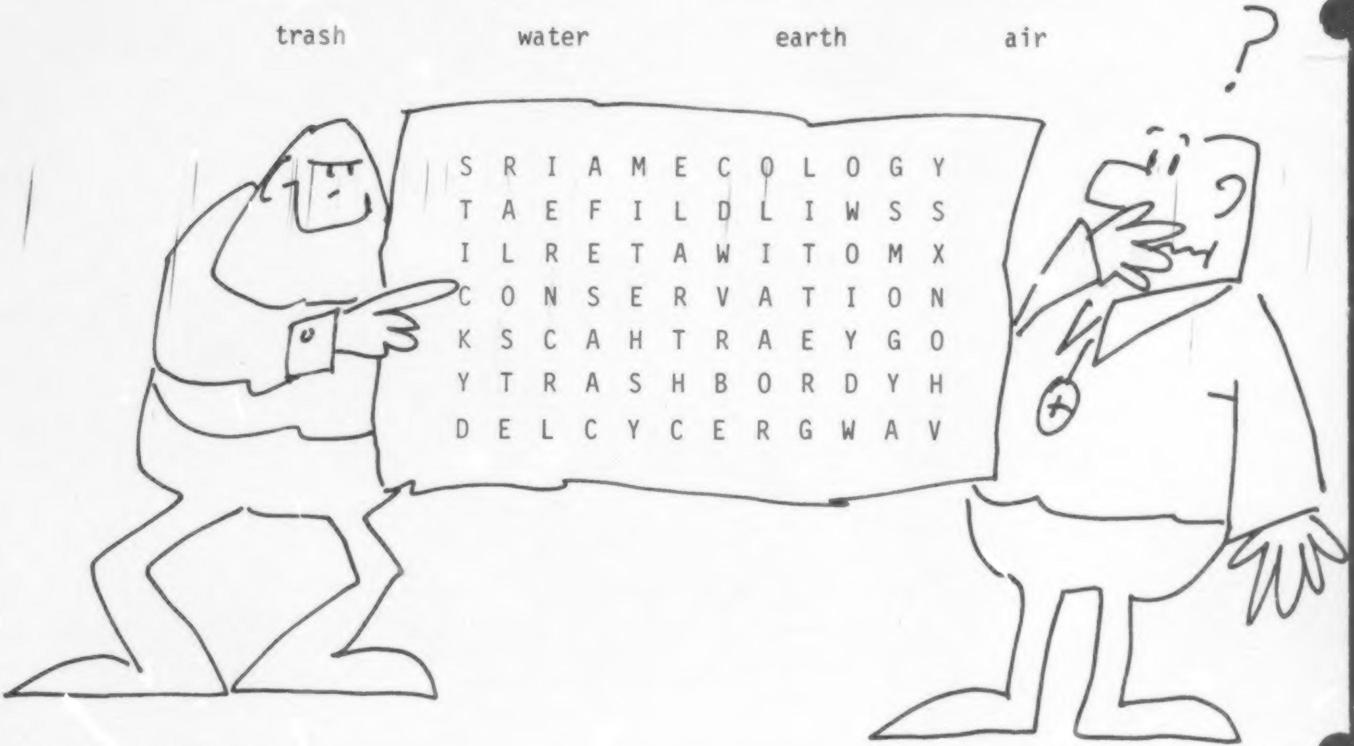
Name ______________________

Directions: Draw a line from the word to its meaning.

solar	smoke and fog in the air
pollute	coming from the sun
smog	a Greek word for water
litter	trash left on the ground
hydro	make dirty

Find the ecology words in this Word Find. The words may be spelled forward, backward, up or down.

ecology
solar
trash
wildlife
recycle
water
smog
conservation
earth
hydro
litter
air



S R I A M E C O L O G Y
T A E F I L D L I W S S
I L R E T A W I T O M X
C O N S E R V A T I O N
K S C A H T R A E Y G O
Y T R A S H B O R D Y H
D E L C Y C E R G W A V

Name ____________________

Here is a page from TV Guide.

Use the page to answer the questions at the bottom of this paper.

TV Guide MAY 11, 1979

1:30 PM to 3:00 PM

④ ONCE UPON A CARROT - Cartoon

⑤ GROWING UP GREEN

2:00 ③ MOVIE - Science Fiction
"Godzilla meets Mr. Greenjeans" (2hrs.)

④ NEWS

⑤ OUR EARTH
How to make money recycling bottlecaps.

⑦ SESAME STREET - Children

2:30 ④ CAPTAIN HYDRO - Cartoon

⑤ M*A*S*H
When the camps electricity goes out, Radar builds his own windmill.

⑦ NATURE CRAFTS

3:00 ④ TODAYS GARDEN
Mr. Flowers tells how to grow pumpkins in your family room.

⑤ ONE ROOT TO GROW - Serial

1. What time is the news shown? ____________________

2. Write the names of the two cartoons.

____

____

3. What is the name of the program that tells you how to make money by recycling bottlecaps?

____

4. What program is on channel ⑦ at 2:30? ____________________

Name ______________________________

Directions: Draw a line under the common nouns in each sentence. Remember, a common noun is the name of a person, place or thing.

1. We can keep our homes warm in the winter.

2. We can save energy too.

3. Here are some ideas.

4. Put a rolled up rug or towel at the bottom of the door to keep out the cold wind.

5. Close the vent in the fireplace when it is not in use.

6. Don't leave the door open while you talk to your friends.

7. Wear socks or "footsies" to bed.

8. Put a sweater on if you get chilly.

9. Pull down the shades at night or close the drapes on windows to keep out the cold air.

10. Set the thermostat below 68 degrees.

Name ______________________________

Directions: The names of these endangered animals are hidden in the sentences below. Find the words and draw a circle around them.

whale manatee yak condor

panda gorilla

1. Don't forget to wash the pan, Dad!
2. A man ate eleven hamburgers for lunch yesterday.
3. Is Igor ill again?
4. I think the party is on the second or third of April.
5. Did you know Haley's comet is only seen once every 75 years?
6. Is he really a king?

Write the names of these endangered animals in alphabetical order.

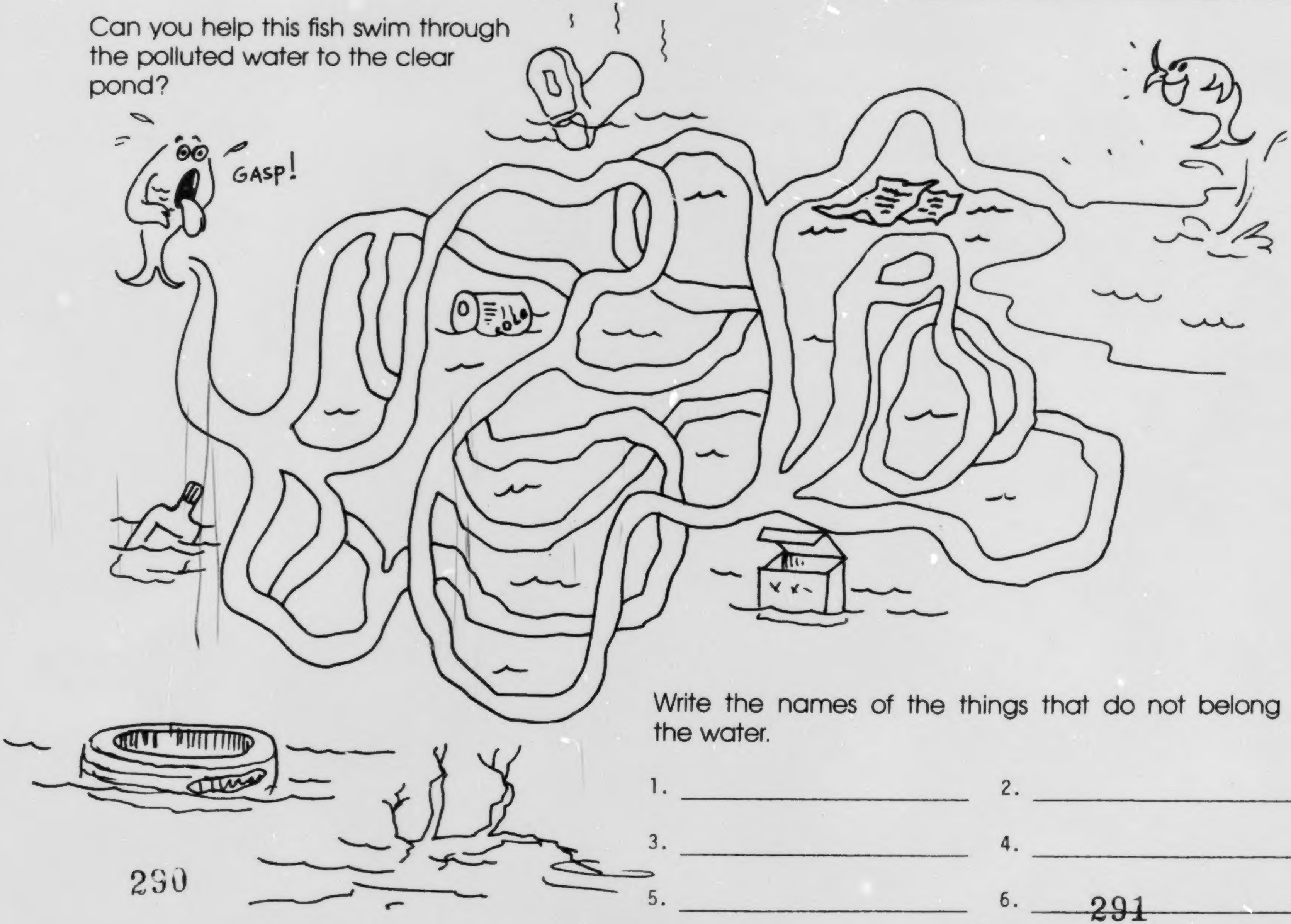
polar bear timber wolf brown pelican

tiger cheetah bald eagle

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________
6. ______________________________

Name ______________________________

Can you help this fish swim through the polluted water to the clear pond?



Write the names of the things that do not belong in the water.

1. ____________________ 2. ____________________

3. ____________________ 4. ____________________

5. ____________________ 6. ____________________

Name ______________________________

SENTENCES?

Directions:
Write Yes in front of each group of words that is a sentence.
Write No in front of each group of words that is not a sentence.

__________ 1. Plastic is made from oil.

__________ 2. The biggest cause of air pollution.

__________ 3. Used mostly in the country.

__________ 4. Petroleum is another word for oil.

__________ 5. Wood is sometimes used to make paper.

__________ 6. All animals need plants.

__________ 7. The most important source of energy.

__________ 8. Burning plastic cups and plates pollutes the air.

__________ 9. Sewage pollutes rivers.

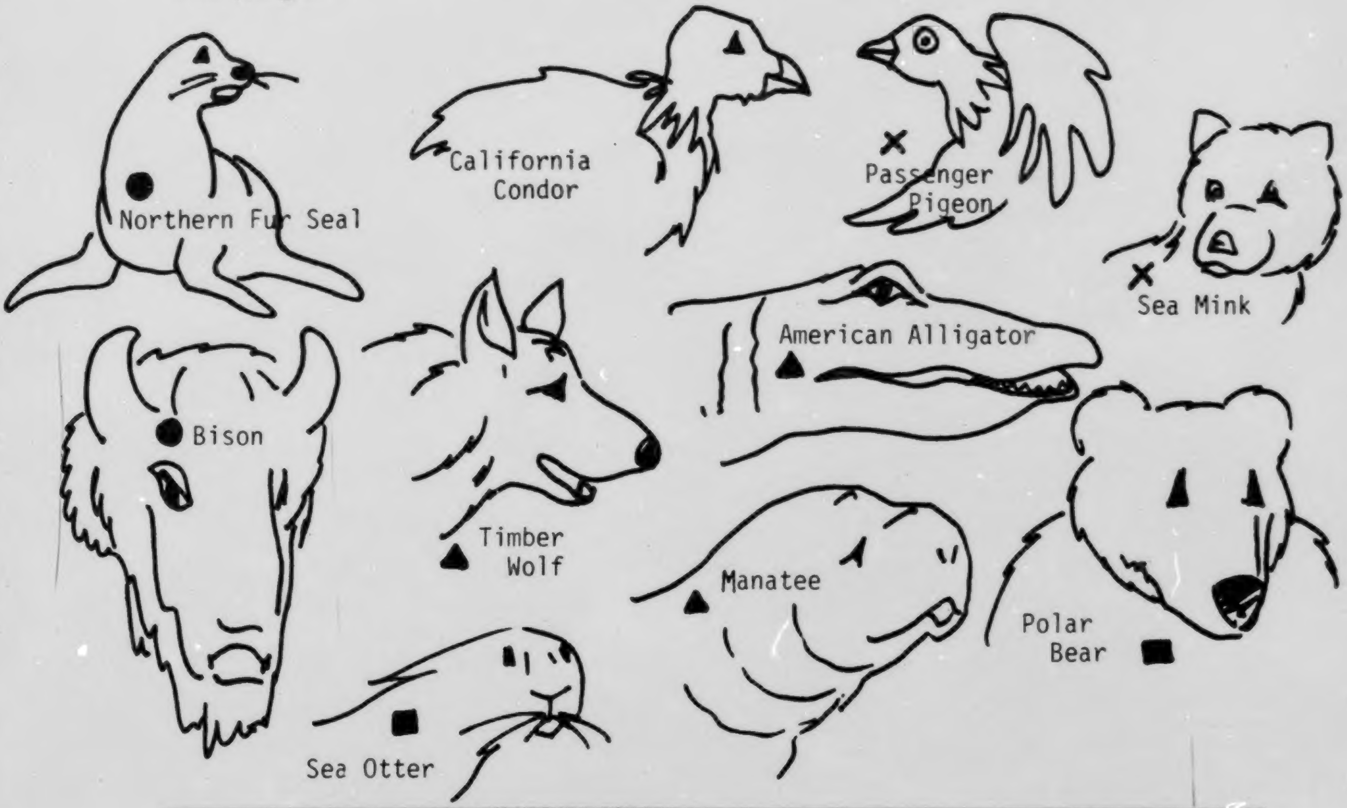
__________ 10. An animal or plant that there are not any more of.

Name ______________________________

PROTECTING OUR WILDLIFE

The United States government now lists 174 kinds of endangered animals. Here are a few that are being carefully watched and some that it is too late to help.

Use the symbols to put the animals in the correct lists at the bottom of the page.


Northern Fur Seal
California Condor
Passenger Pigeon
Sea Mink
American Alligator
Bison
Timber Wolf
Manatee
Polar Bear
Sea Otter

● An animal that was in trouble but is now out of danger.

1. ______________________________ 2. ______________________________

■ Threatened

1. ______________________________ 2. ______________________________

▲ ENDANGERED

1. ______________________________ 2. ______________________________

3. ______________________________ 4. ______________________________

✖ EXTINCT

1. ______________________________ 2. ______________________________

Name ______________________________

Directions: Complete the sentences by writing a word in the blank spaces. Write the word on the numbered spaces that follow each sentence. Use these letters as a code to find the answer to the question.

What is the most important reason to recycle things?

Bottles and jars made of GLASS can be crushed to make new ones.

G L A S S
9 8 5 4 4

Aluminum __________ can be melted down to make new ones, too.

6 5 3 4

Recycling paper saves our __________.

2 7 1 1 4

Cans made of ______ can also be recycled.

2 10 3

Many things can be ________ over again.

11 4 1 12

Recycling can _________ money.

4 5 15 1

Is there a recycling center in ________ neighborhood?

14 13 11 7

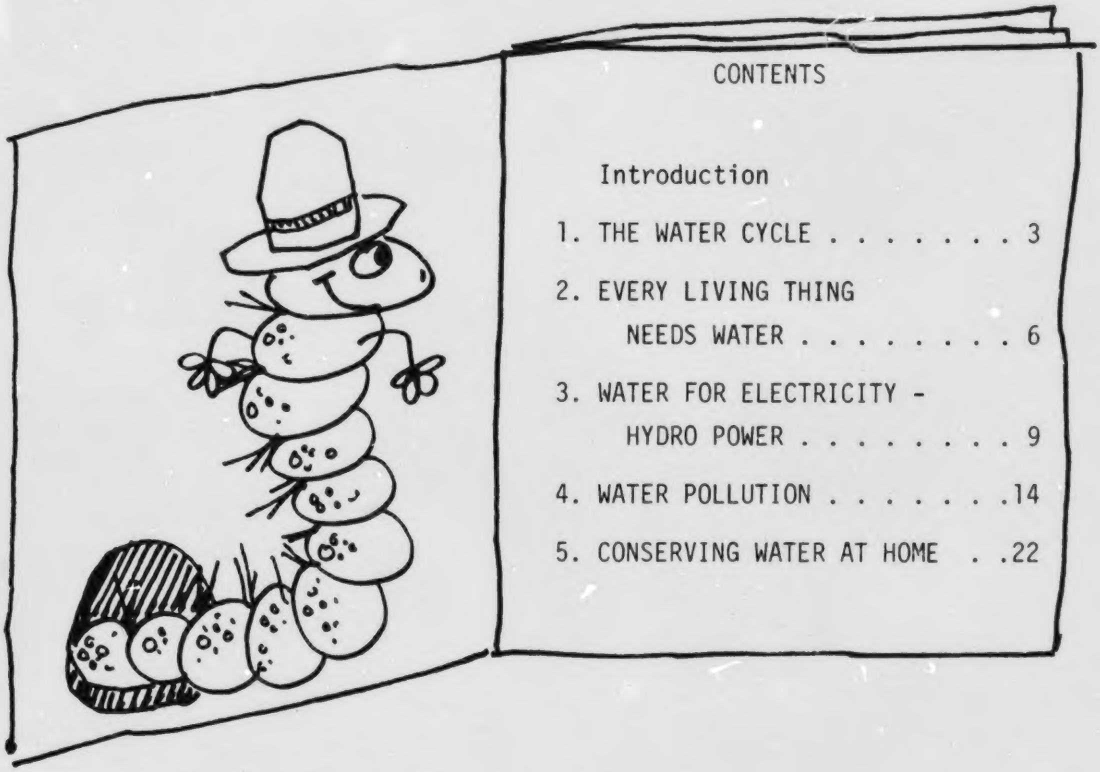
7 1 6 14 6 8 10 3 9(G)   4 5 15 1 4

13 11 7   3 5 2 11 7 5 8(L)

7 1 4 13 11 7 6 1 4.

Name ______________________________

Directions: Use the Table of Contents to answer the questions.



CONTENTS

Introduction

1. THE WATER CYCLE 3

2. EVERY LIVING THING NEEDS WATER 6

3. WATER FOR ELECTRICITY - HYDRO POWER 9

4. WATER POLLUTION 14

5. CONSERVING WATER AT HOME . .22

1. To find out that we cannot live without water, you should look on page ____________.

2. The chapter about the water cycle begins on page _________.

3. Ways of saving water begin on page __________.

4. The problems of dirty water start on page __________.

5. How we use water to light our homes will begin on page ___________.

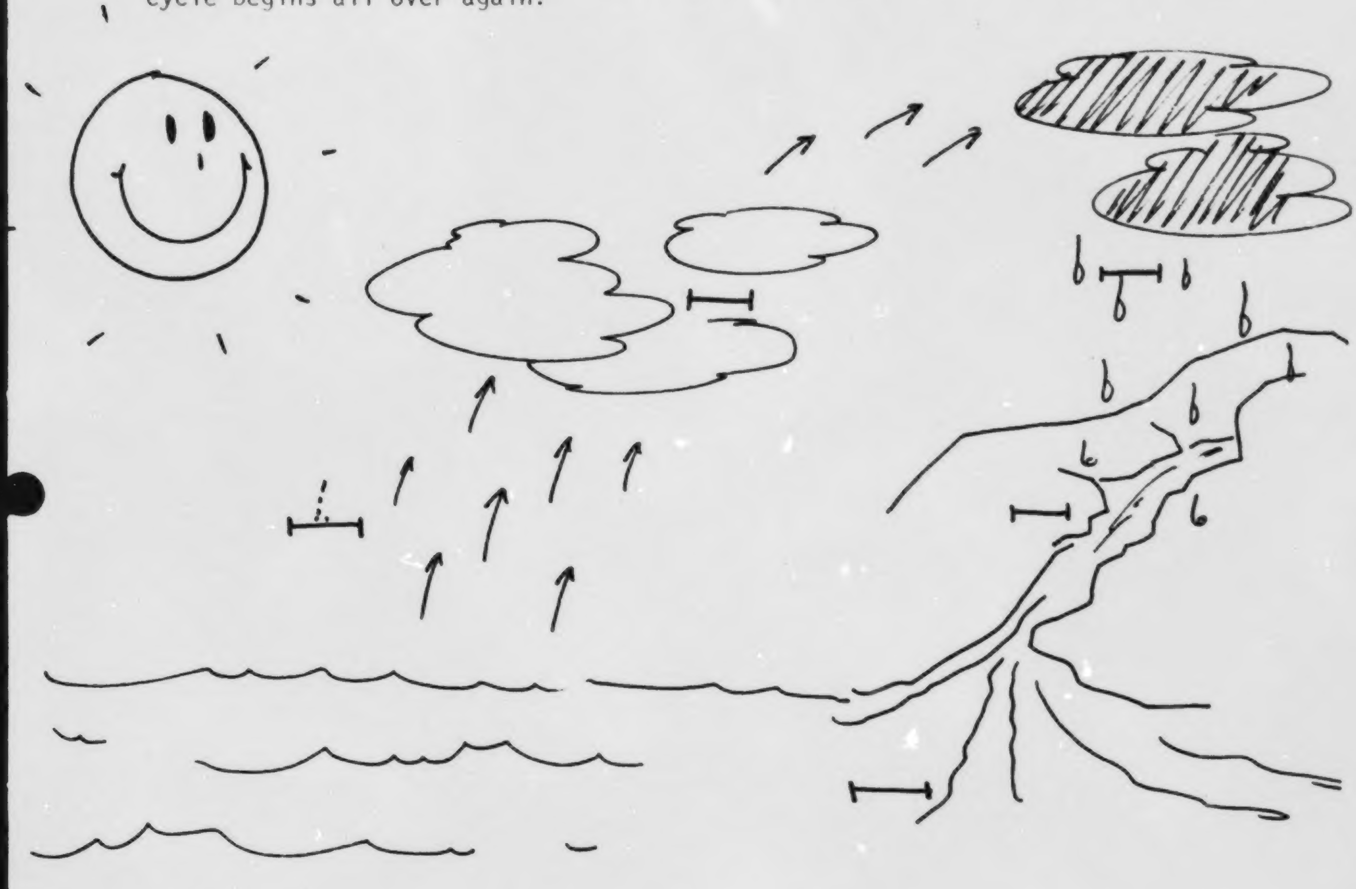
6. Fixing faucets that drip and taking short showers will begin on page ________.

Name ________________________________

THE WATER CYCLE

A cycle is a circle of events that happen over and over again in the same order. Here is how nature's water cycle works.

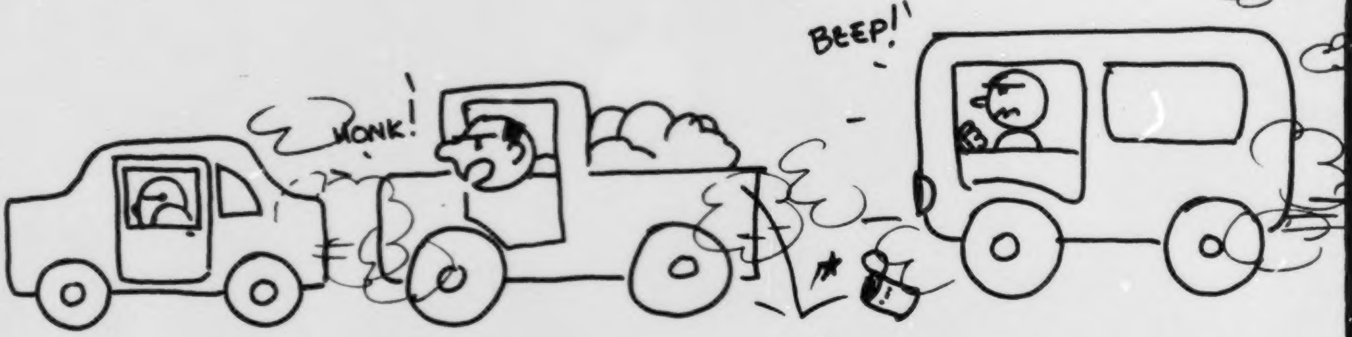
Solar energy (heat from the sun) evaporates the waters from oceans and lakes. This water becomes water vapor as it rises in the air. The water vapor gathers together to become clouds. As the clouds get bigger and heavier, they cool and turn into rain. When it rains, the water runs into rivers and streams. These rivers and streams flow back to the lakes and oceans and the cycle begins all over again.



Put these numbers on the part of the picture that shows what is happening.

1	The sun's energy evaporates the water.
2	The water vapor gathers into clouds.
3	The clouds cool and rain begins.
4	Rain runs into rivers and streams.
5	The rivers and streams flow back to the ocean and lakes.

Name ______________________________



Here are some things that cause pollution.

Unscramble the words and write the letters on the matching numbered spaces below. If you are correct, you will find out how we should keep our environment.

1. RSAC   1.___ ___ ___ ___

2. TETRIL   2.___ ___ ___ ___ ___ ___

3. KSOEM   ___ ___ ___ ___ 3.___

4. RAILENSPA   ___ ___ ___ ___ ___ 4.___ ___ ___ ___

5. OINES   5.___ ___ ___ ___ ___

This is how we should keep our environment.   1.___ 2.___ 3.___ 4.___ 5.___

Name ______________________________

SAVE THAT CAN!!

Directions: Draw one line under the complete subject. Draw two lines under the complete predicate.

1. Recycling is important.

2. Our natural resources will last longer.

3. We won't have as much trash.

4. Many materials can be recycled.

5. Glass, tin, aluminum and paper can be used to make new things.

6. All of us can save newspapers for recycling.

7. Some paper companies will buy old newspapers.

8. People can save energy and money too.

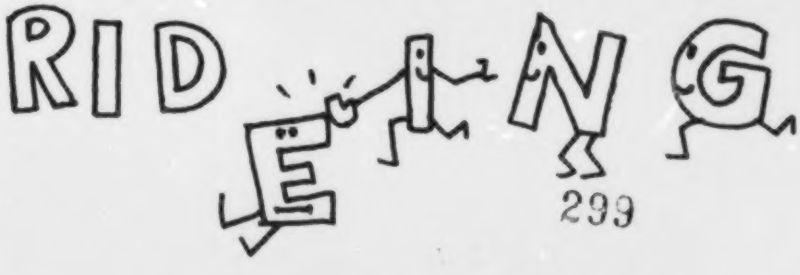
Name ____________________

Directions:
Read the sentences. Add ing to the underlined words and fill in the blanks.

Don't forget to drop the silent e.

Example: come coming

1. Since cars cause air pollution, car pooling is better than drive ____________________ alone.
2. Letting the faucets drip is waste ____________________ water.
3. Throwing trash out your car window is cause ____________________ pollution of the earth.
4. Use ______________ paper cups is more wasteful than drinking from cups that can be washed and used many times.
5. Smoke ____________________ chimneys from factories pollute the air.
6. Smog in the air is damage ____________________ to plants and animals.
7. Dumping sewage into lakes and rivers is make ____________________ them polluted.
8. Take ____________________ old newspapers to a recycling center helps save trees.
9. Oil spilled in the ocean is pollute ____________________ the water and killing birds and fish.
10. Using too much paper and plastic in package ____________________ the things we buy causes pollution of the earth.



Name ______________________

Mrs. Peterson's class is having a spelling bee.

Cross out the incorrect words to find out which team spelled more words correctly.

Betty's Team	Frank's Team
1. clean	1. clene
2. earth	2. earthe
3. dirtee	3. dirty
4. pollution	4. polution
5. littre	5. litter
6. smog	6. smoog
7. conservashun	7. conservation
8. saveing	8. saving
9. waste	9. wast
10. recycle	10. recycal

How many words did Betty's team spell correctly? __________

How many words did Frank's team spell correctly? __________

Which team won the spelling bee? ____________________

C-A-T
R-A-T
SPELLING BEE

Name ______________________________

Directions: Mark the circle in front of the correct word in each sentence.

1. Solar energy comes from the 0 sun.
   0 Sun.

2. 0 we
   0 We should not waste water.

3. Picking up litter will help keep 0 america
   0 America clean.

4. The "don't pollute" owl is named 0 Woodsy.
   0 woodsy.

5. Hydro power comes from 0 water.
   0 Water.

6. We are trying to keep 0 california
   0 California green.

7. Littering is one way we pollute the 0 earth.
   0 Earth.

8. The 0 dinosaur
   0 Dinosaur is an extinct animal.

9. A volcano in our state is 0 Mt. Lassen.
   0 mt. lassen.

10. Smog is a kind of 0 air
    0 Air pollution.

11. Not wasting paper in 0 school
    0 School helps to save our trees.

12. 0 i
    0 I am not a litterbug.

Name ______________________________

PARTS OF A LETTER

Letters usually have five parts: the heading, the greeting, the body or main part of the letter, the closing, and the signature.

Correct the "body" of the letter below by putting periods at the ends of sentences and beginning the new sentences with capital letters.

350 Sunshine Way
San Jose, California
March 13, 1979

Dear Sam,

I really like my new house we are almost unpacked my dad and I are putting solar panels on the roof the sun heats up the water in the panels and we get hot water in the house they call it solar heating because the heat comes from the sun.

It is one way of saving energy and money, too. I'll show you how it works when you come to visit, make it soon.

Your friend,

Jack

Draw a line under the greeting.

Put a box around the heading.

Make a circle around the closing.

Put an X on the signature.

Name ______________________________

Directions: Put a period (.) or question mark (?) at the end of each sentence.

1. The most important liquid is water __
2. We use water for drinking and for raising food __
3. What do firemen use water for __
4. In June, we swim in pools, lakes and oceans __
5. When will Ann water her plant __
6. I turn off the water when I'm finished brushing my teeth __
7. Why did Jack and Jill go up the hill __
8. Who is Captain Hydro __
9. The Pacific and Atlantic Oceans are large bodies of water __
10. It usually rains in December, January, and February __
11. Water is our most important natural resource __
12. How long could man live without water __
13. Water flowing downhill turns waterwheels __
14. How can I make Kool-Aid without water __
15. All plants and animals need water to live __

Name ______________________________

Directions: Find the contraction in each sentence and draw a line under it. Write the contraction and its meaning on the blanks.

1. I'm going to save water.

   I'm ______ I ______ am ______

2. When I brush my teeth, I won't leave the water running.

   ______________ __________ __________

3. I'll ask my Mom or Dad to fix the leaky faucets.

   ______________ __________ __________

4. We'll all take short showers instead of baths.

   ______________ __________ __________

5. Putting things down the toilet isn't a good idea.

   ______________ __________ __________

6. Everyone knows we shouldn't waste water.

   ______________ __________ __________

7. I don't think it will be very hard to do.

   ______________ __________ __________

Name ______________________________

Directions:
Read the story. Write the underlined words in the correct column below. Divide the two syllable words.

USING THE WIND AND WATER FOR ENERGY

Long ago people invented simple machines to help them do their work. Some of these early machines got their power (energy) from the wind or from running water. Windmills and waterwheels were used to grind grain and to pump water.

Using the wind and water to operate their machines made work easier for people. It didn't cost much either because the wind and the water were free. This was better than using muscle power.

But the wind didn't always blow and then people couldn't use its energy. Also some people did not live near fast moving water, so they couldn't use that energy either.

People began to find new ways to get energy. They began cutting wood and using fossil fuels to burn. These fuels are still used today to provide energy for our machines.

Z
ENERGY SAVING

One syllable words	Two syllable words
1. help	1. run/ning
2.	2.
3.	3.
4.	4.
5.	5.

Name ______________________________

Directions: Use these words to make compound words in the sentences below.

shine papers ground times

shore bugs one wood way life

1. News ________________________ can be recycled to save our trees.

2. Please do not litter the play __________________________.

3. Both plants and animals need sun ________________________.

4. The teacher asked every _____________ to save soup labels.

5. People who drop trash on the streets are litter _________________.

6. Red _________________ trees usually grow in parks close to oceans.

7. Too many cars on the high _______________ can cause air pollution.

8. Forest rangers help to protect our wild __________________.

9. Dirty air some ____________________ causes people to get sick.

10. Cans and bottles left on the beach litter our sea ____________________.

Name ______________________________

HOMONYMS are words that sound alike but are spelled differently and have different meanings.

Connect the words that sound alike.

one
bear
blue
deer
right
no
flower

blew
dear
won
write
bare
flour
know

Choose the correct homonym to complete these sentences.

1. The wind ____________________ the dirty air away.
blue blew

2. An animal that likes to eat plants is a ____________________.
deer dear

3. Not wasting water is the ________________________ thing to do.
write right

4. The panda ____________________ is an endangered animal.
bare bear

5. We ____________________ that cars cause air pollution.
know no

6. The ________________ warms our earth.
son sun

Name ______________________________

SYNONYMS — Words that mean the same thing or almost the same thing.

Directions: Use the following words to fill in the blanks in the sentences below. Write the word in the blank that means almost the same thing as the word in (parentheses).

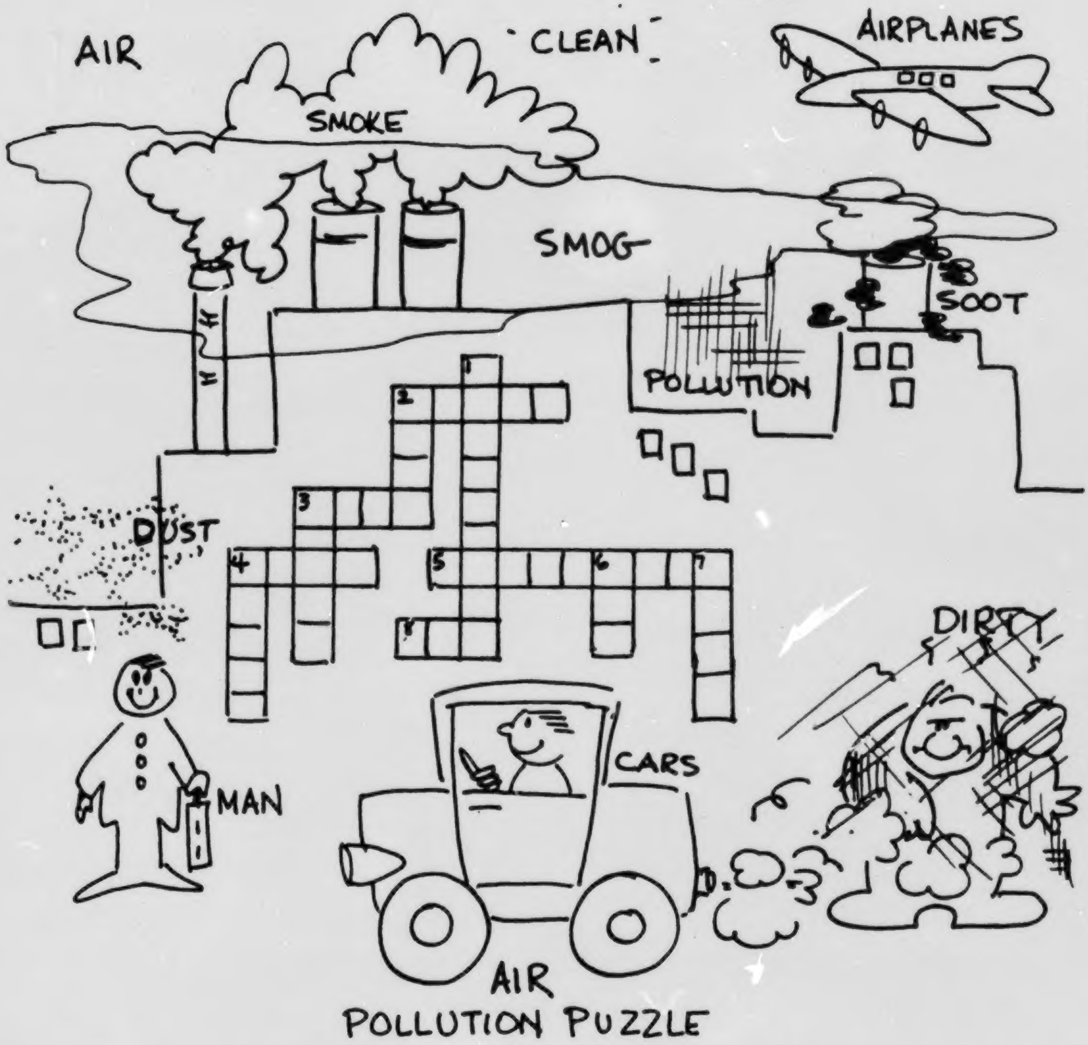
collect build as instead save

soil clean shut pile litter

Here are some ways you can help to (conserve)______________________ our natural resources.

1. Turn off the faucet (while)________________ you brush your teeth.
2. When you can, take short showers (rather than)______________________ of baths.
3. Do not burn papers or leaves. Instead make a compost (heap)______________ that will help the (dirt)_____________________.
4. (Make)__________________________ a bird house. Birds are the natural enemies of insects.
5. Plant a tree. They help to (wash)______________________ the air.
6. Keep a (trash)_____________________ bag in your car, and use it!
7. When you leave a room, (close)____________________ off lights, radio and TV.
8. Save old newspapers for groups that (gather)_____________________ them or recycle the newspapers yourself.

Name ______________________________


AIR
CLEAN
AIRPLANES
SMOKE
SMOG
SOOT
POLLUTION
DUST
DIRTY
CARS
MAN
1
2
3
4
5
6
7
8
AIR
POLLUTION PUZZLE

Across

2. Smog is fog and ________.
3. Powdered dirt is _________.
4. Exhaust from _________ adds dirt to the air.
5. Exhaust from ___________ also adds dirt to the air.
8. Only __________ can help clean up the air.

Down

1. Dirty air is called ________.
2. Ashes are sometimes called ____________.
3. Polluted air is _________.
4. Air without pollution is ________________.
6. We need _______ to breathe.
7. Smoke mixed with fog is _____.

303

Name ______________________________

ANTONYMS — Words with opposite meanings.

Directions: Draw a line between the words that are opposites.

easy	clean
conserve	beautiful
alive	out
dirty	dead
ugly	waste
in	hard

Use some of the words to fill in the blanks of the sentences.

1. Cars do not make our air clean. They make it ____________________.

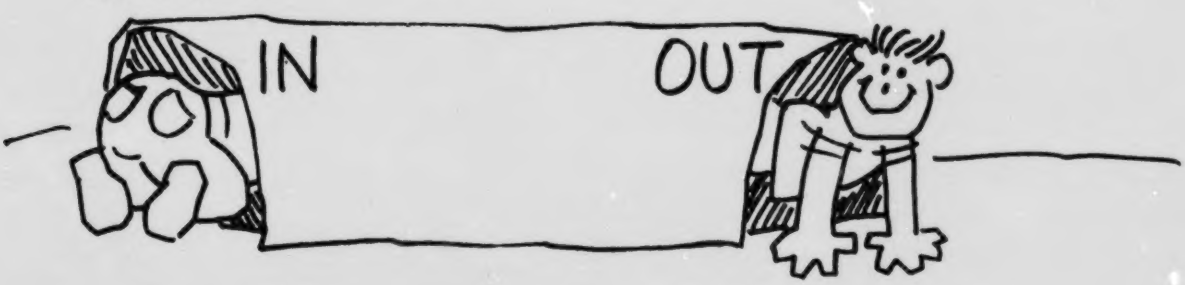
2. When animals are extinct, there are none left alive. They are all ____________________.

3. A beautiful park will look __________________ after a forest fire.

4. We need to conserve our natural resources. We should not ______________ them.

5. When people move into the animals habitats, the animals move ___________.

6. It is not hard to recycle things. There are lots of __________________ ways to do it.



Name ______________________________

ENDANGERED ANIMALS

Here are some animals that there are only a few of left on the earth. They are called "endangered" because soon there may not be any more and they will become "extinct".

If people care enough, they may be able to save some of these animals who are in danger.

Find these endangered animals in the puzzle.

WHALE TIGER CHEETAH MANATEE
RHINOCEROS YAK POLAR BEAR
PANDA TIMBER WOLF GORILLA
OTTER FERRET VICUNA

A	N	I	M	A	L	S	H	O	P
S	R	T	A	D	N	A	P	D	I
E	H	O	C	P	T	X	G	A	G
T	I	M	B	E	R	W	O	L	F
I	N	B	E	M	O	C	R	H	E
G	O	H	E	T	H	E	I	W	R
E	C	X	T	W	H	A	L	E	R
R	E	E	A	T	M	F	L	K	E
T	R	E	N	R	W	Y	A	K	T
P	O	L	A	R	B	E	A	R	A
R	S	E	M	A	N	U	C	I	V

Name ____________________

Directions:
Write the following words in alphabetical (ABC) order.

pollution solar smog recycle

extinct conservation important endangered

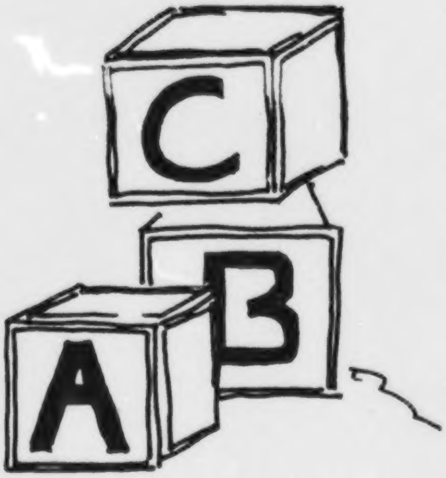
1. ____________________
2. ____________________
3. ____________________
4. ____________________
5. ____________________
6. ____________________
7. ____________________
8. ____________________

Use the first letter of the words on lines 8, 4 and 6 to find the answer.

"What do you call a 2000 pound gorilla?" ___ ___ ___ !

Name ______________________________

Directions: Each alphabet has a letter missing. Write the missing letters on the spaces to find the answers to the two questions.



1. A B C D E F G H I J K L M N O P Q R S U V W X Y Z
2. A B C D E F G I J K L M N O P Q R S T U V W X Y Z
3. [illegible]
4. A B C D E F G H I J K L M N O P Q R T U V W X Y Z
5. A B C D E F G H I J K L M N O P Q R S T V W X Y Z
6. A B C D E F G H I J K L M O P Q R S T U V W X Y Z

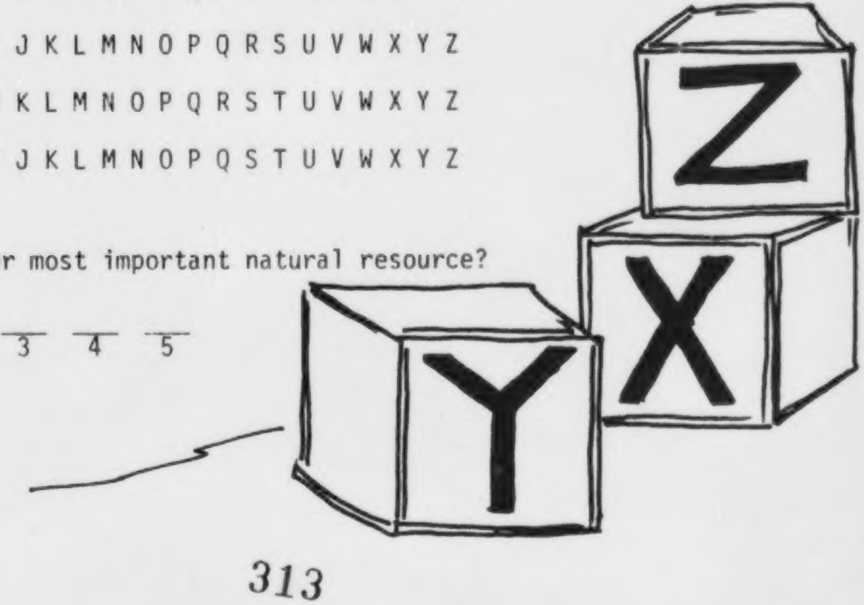
Question: What is our most important source of energy?

Answer: __ __ __   __ __ __
1 2 3   4 5 6

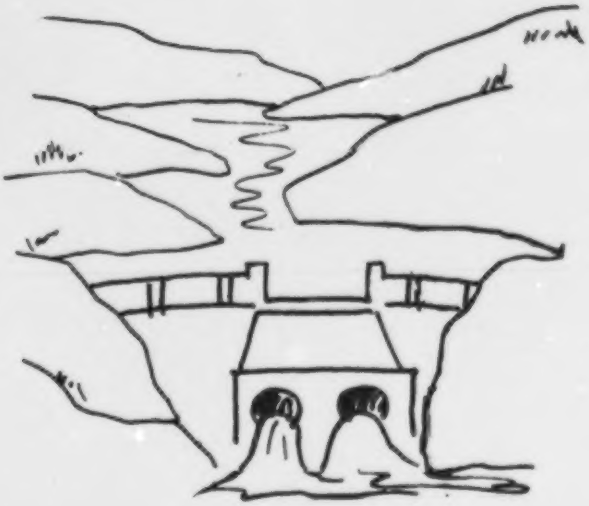
1. A B C D E F G H I J K L M N O P Q R S T U V X Y Z
2. B C D E F G H I J K L M N O P Q R S T U V W X Y Z
3. A B C D E F G H I J K L M N O P Q R S U V W X Y Z
4. A B C D F G H I J K L M N O P Q R S T U V W X Y Z
5. A B C D E F G H I J K L M N O P Q S T U V W X Y Z

Question: What is our most important natural resource?

Answer: __ __ __ __ __
1 2 3 4 5



Name ______________________



Directions:

Write the correct word in the space in each sentence.

1. The wind, water and sun (was, were) ________________ the first kinds of energy.

2. They (is, are) ______________ the three kinds of energy that cannot be used up.

3. A sailboat (is, are) _______________ moved by the wind.

4. Windmills (was, were) _________________ used to pump water on most farms.

5. Sun power (is, are) _______________ called solar power.

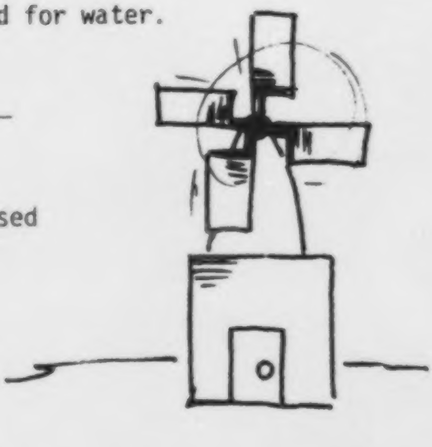
6. Clothes hanging on a clothesline (is, are) _____________ dried by the heat from the sun.

7. Some swimming pools (is, are) _________________ heated by solar power.

8. Hydro (is, are) ______________ another word for water.

9. Many dams (was, were) ___________________ built to get energy from falling water.

10. Moving water (is, are) ________________ used to turn wheels to make electricity.



Name ______________________________

Directions: Read the sentences. Circle the correct word.

1. You have (heard, hear) that paper comes from trees.

2. Did you know that paper can be (make, made) from old used paper?

3. It is (called, calling) recycled paper.

4. Cardboard (come, comes) from old paper with the ink left in.

5. Paper companies are (cut, cutting) down more and more trees to make paper.

6. New trees are not (growing, growed) fast enough to replace trees that are cut.

7. Some companies are (chop, chopping) down trees in our national forests.

8. If we recycle our paper, we can help to (save, saves) some of our trees.

9. You can collect old newspapers and (take, took) them to a recycling center.

10. You can (recycling, recycle) paper at home and at school.

11. (Use, Used) the back of old paper for scratch paper.

12. Can you (thinks, think) of other ways to recycle paper?

Name ______________________________

RHYMING WORDS

Directions: Circle the words in each row that rhyme with the first word.

sun	-	fun	ran	one	won
light	-	night	bright	kite	tiger
smoke	-	choke	joke	small	poke
tree	-	easy	knee	see	we
grow	-	show	know	look	go

Add a word to finish these rhymes.

Nancy planted a flower seed.
But all that grew was a great big ___________________.

A forest fire can kill many trees.
So be very careful with matches, ______________________.

Lightning can start a forest fire, too.
Not a nice thing for Mother Nature to _______________.

With all the pollution up in the sky,
It's getting harder for all birds to ______________.

The bright blue lake is changing today.
Trash and sewage are turning it _________________.

Name ______________________________

Many people are trying to clean up our environment. Here is a list of ways to help.

Directions: Write Yes in front of the ways that will help.
Write No in front of the ways that are foolish and will not help.

________ 1. Turn off the water while you are brushing your teeth.

________ 2. Paint everything white so it will look cleaner.

________ 3. Whenever you can, use things over again.

________ 4. Pick up litter.

________ 5. Save the sunlight in boxes in your garage.

________ 6. Write on both sides of the paper.

________ 7. On short trips, walk or ride your bicycle.

________ 8. Use your vacuum cleaner to get rid of the dirt in your backyard.

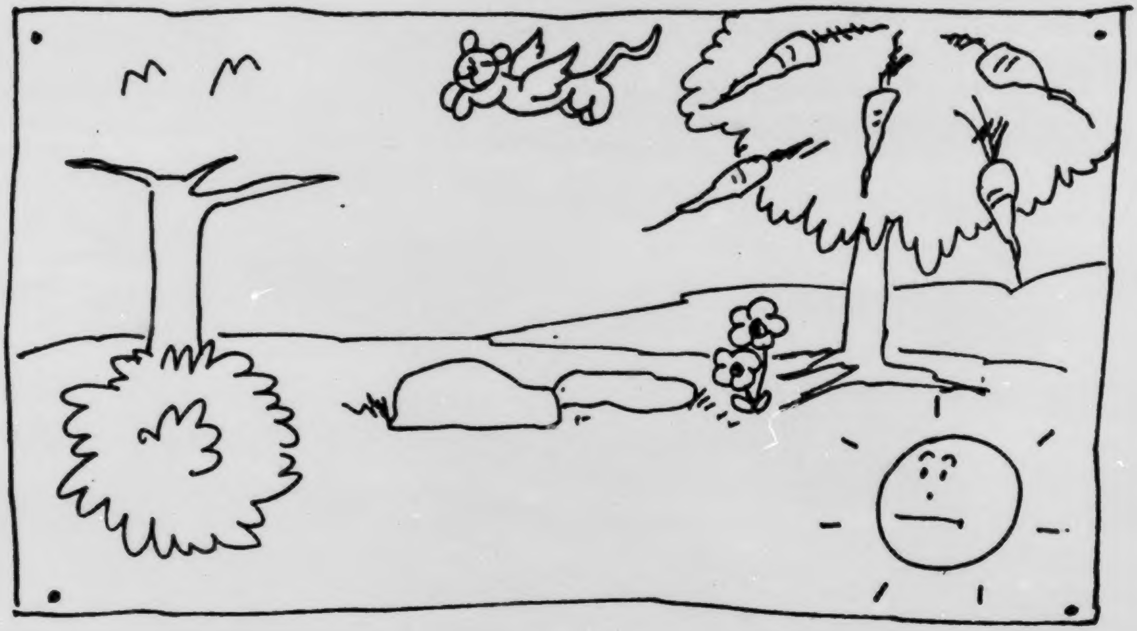
________ 9. Take bottles, cans, and newspapers to recycling centers.

________ 10. Plant a forest in your bedroom to keep the air clean.

SUN SHINE
SUN LIGHT
SUN SHINE

Name ______________________________

Put an X on the things in the picture that are wrong.



Use the graph to read the sentence:

	1	2	3	4	5	6	7
A	a	b	c	d	e	f	g
B	h	i	j	k	l	m	n
C	o	p	q	r	s	t	u
D	v	w	x	y	z		

i ___ ___ ’ ___   ___ ___ ___   ___ ___ ___ ___   ___ ___

2B 6C 5C   7B 1C 6C   7B 2B 3A 5A   6C 1C

___ ___ ___ ___   ___ ___ ___ ___ ___ ___   ___ ___ ___ ___ ___ ___ .

6A 1C 1C 5B   6B 1C 6C 1B 5A 4C   7B 1A 6C 7C 4C 5A

Name ____________________

KEEP YOUR LAND CLEAN

Directions: Do the problems.
Use your answers to read the message.

T 6 x4	**E** 7 x3	**X** 5 x6	**N** 7 x4
L 9 x6	**V** 7 x7	**A** 3 x9	**I** 2 x8
O 5 x4	**B** 6 x6	**G** 4 x3	**R** 8 x5

36 21   27 28   21 27 12 21 40   36 21 27 49 21 40,

28 20 24   27   54 16 24 24 21 40

54 21 27 49 21 40 !

Name ______________________________

Directions: Read the problems. Write the numerals on the blank spaces.

1. Carole and Judy are saving cans for recycling. They each have 8 cans saved so far. How many do they have together?

   8 X 2 = ________ cans

2. Tom, Dick and Harry are saving cans too. They have each saved 9 cans. How many do they have all together?

   _____ X _____ = ________ cans

3. Six girls in the third grade each saved 7 stacks of newspapers. How many stacks of newspapers do they have in all?

   _____ X _____ = ________ stacks of newspapers

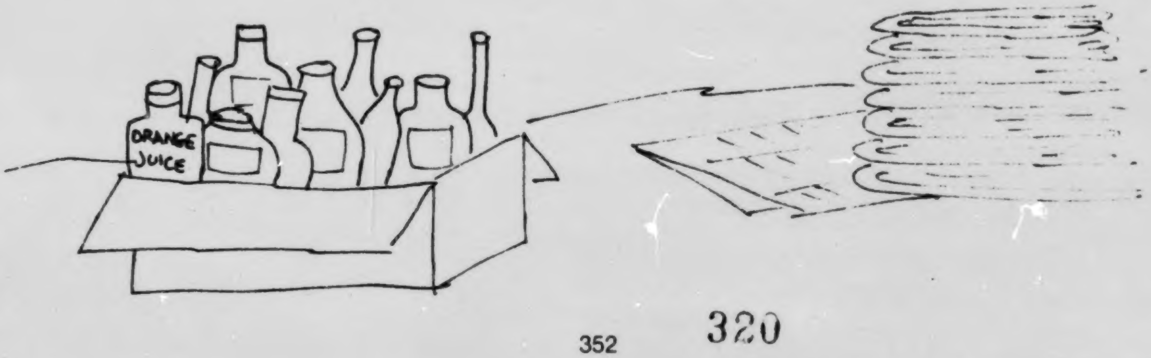
4. Bob and Betty saved 4 boxes of glass bottles. Each box had 8 bottles in it. How many bottles did they have all together?

   _____ X _____ = ________ bottles

5. Jim and Mary were saving bottles too. They had 5 boxes of bottles. Each of their boxes had 7 bottles in it. How many bottles did Jim and Mary have?

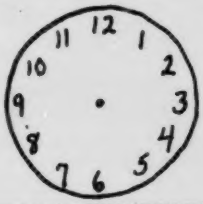
   _____ X _____ = ________ bottles

6. If Bob and Betty put their bottles together with Mary and Jim's, how many will they have in all?

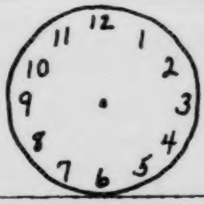


Name ______________________________

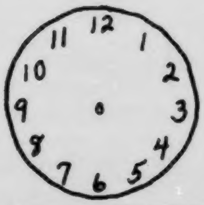
Directions:
This is Bill's conservation schedule. Draw the hands on the clocks.


12
1
2
3
4
5
6
7
8
9
10
11

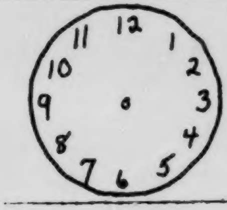
8 o'clock - Collect newspapers to recycle


12
1
2
3
4
5
6
7
8
9
10
11

9:30 - Collect tin cans and bottles to recycle


12
1
2
3
4
5
6
7
8
9
10
11

10:15 - Go to the recycling center


12
1
2
3
4
5
6
7
8
9
10
11

11:20 - Pick up litter in neighborhood

Write the time.

1. When did Bill pick up litter? ______________

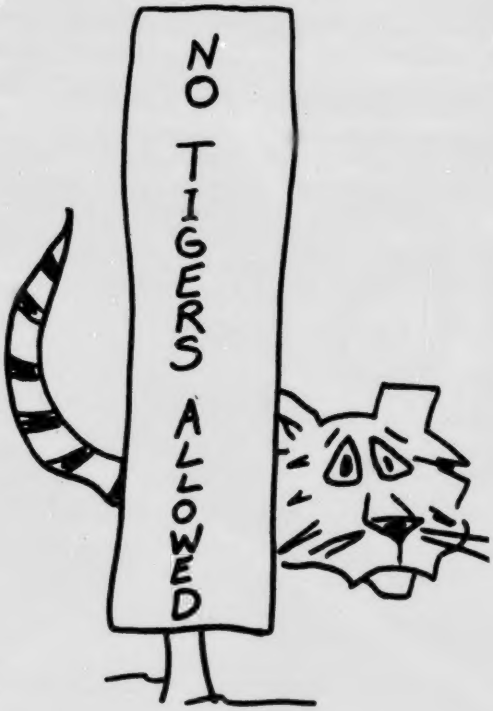
2. At what time did Bill get the newspapers? ______________

3. Bill went to the recycling center at ______________.

4. When did Bill start to collect cans and bottles? ______________

Name ______________________________

Many plants and animals cannot live where there are lots of people. As people build more and more houses and roads, the animals must move. Often, when animals are forced to leave their natural habitats, they die.



Directions: Use the sign to fill in the blanks.

1. The fourth letter of the second word E
2. The first letter of the first word _____
3. The last letter of the last word _____
4. The first letter of the third word _____
5. The same as number 2 _____
6. The third letter in the second word _____
7. The sixth letter in the third word _____
8. The fifth letter in the second word _____
9. The letter before the fifth letter in the second word _____
10. The fifteenth letter in the phrase _____

Use the letters in the blanks to complete the sentence.

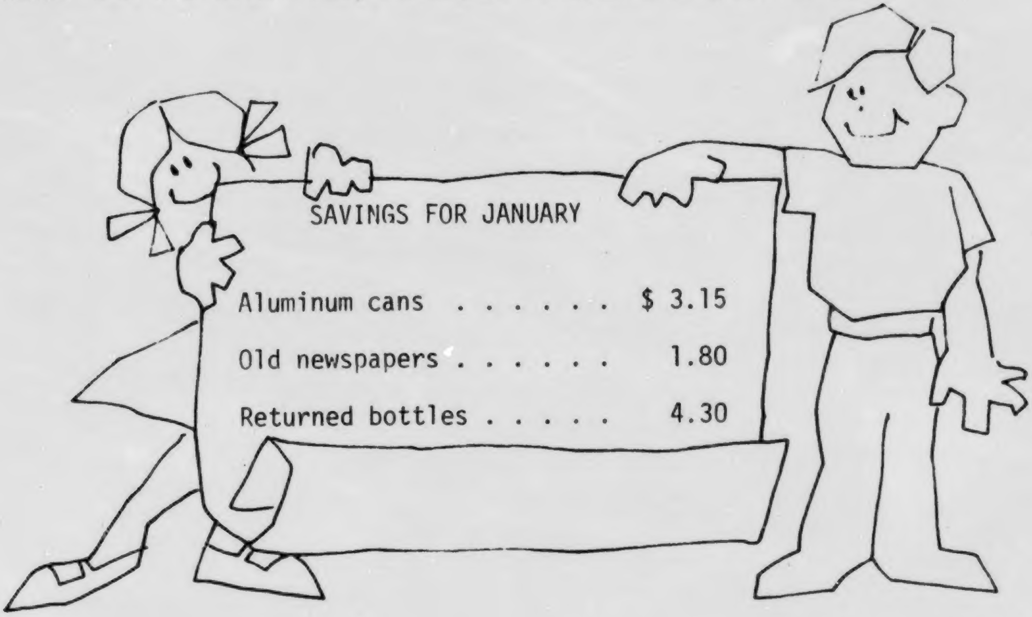
When there are very few of a kind of plant or animal left alive, we say they are ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ .

Name ______________________________

Recycling saves our natural resources, energy, and helps to stop waste.

The third grade class at John Muir School began to recycle things to buy something new for their classroom.

Directions: Use the chart they made to answer the questions.

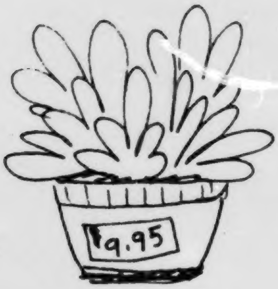


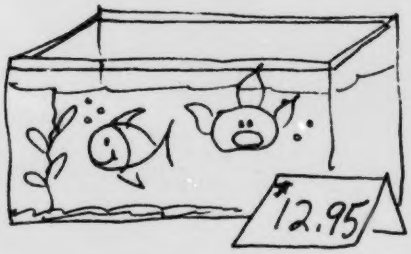
SAVINGS FOR JANUARY

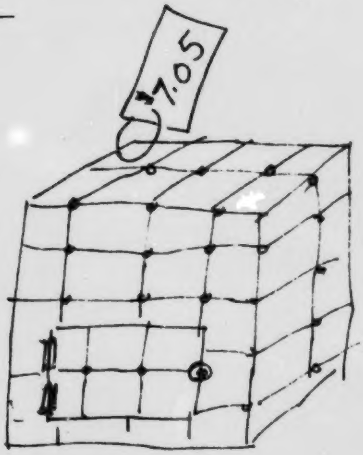
Aluminum cans	$ 3.15
Old newspapers	1.80
Returned bottles	4.30

How much money have they save in January? __________

Here are three things the class wants to buy.







Which one can they buy now? __________________________

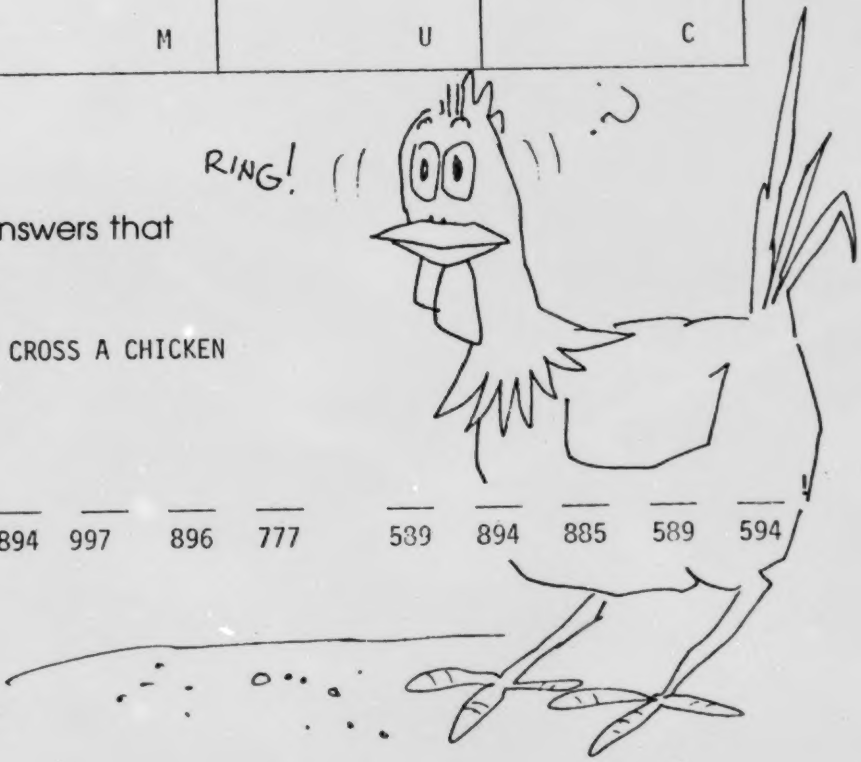
How much money will they have left? __________

Name ______________________________

People use animals for many different things. We get food and clothes from animals. They can help us do work, provide transportation, and keep us company by being our pets.

Directions: Do the addition problems to answer the silly riddle below.

436 + 362 798 N	712 + 184 R	845 + 152 A	393 + 201 K
573 + 321 L	514 + 263 M	271 + 614 U	463 + 126 C

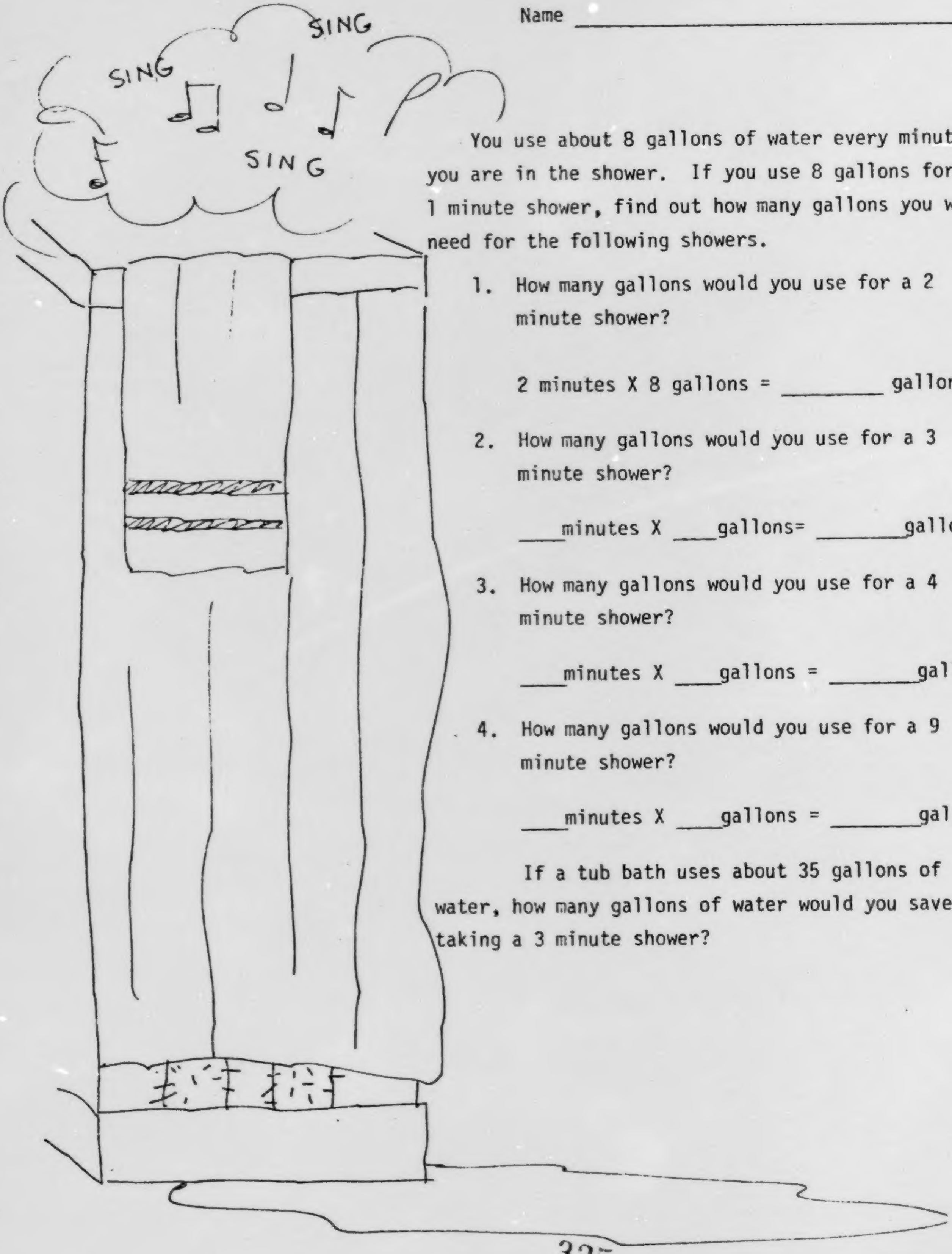


Put the letters of the answers that match on the lines.

WHAT DO YOU GET WHEN YOU CROSS A CHICKEN
WITH A BELL?

___	N	___	___	___	___	___	___	___	___	___	___
997	798	997	894	997	896	777	589	894	885	589	594

Name ______________________________



You use about 8 gallons of water every minute you are in the shower. If you use 8 gallons for a 1 minute shower, find out how many gallons you will need for the following showers.

1. How many gallons would you use for a 2 minute shower?

   2 minutes X 8 gallons = ________ gallons

2. How many gallons would you use for a 3 minute shower?

   ___minutes X ___gallons= _______gallons

3. How many gallons would you use for a 4 minute shower?

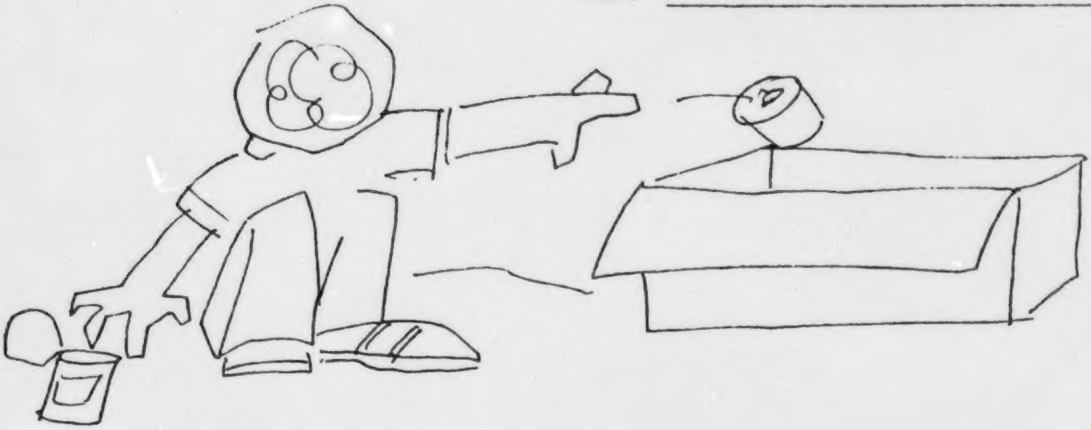
   ___minutes X ___gallons = _______gallons

4. How many gallons would you use for a 9 minute shower?

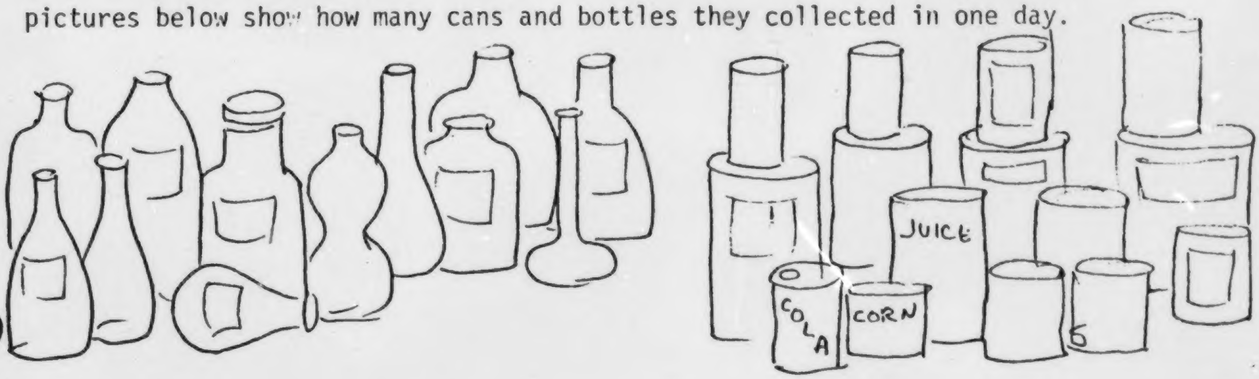
   ___minutes X ___gallons = _______gallons

If a tub bath uses about 35 gallons of water, how many gallons of water would you save by taking a 3 minute shower?

Name ______________________________



Four children have a recycling club. Two of the children are collecting no deposit bottles. The other two children are saving aluminum cans. The pictures below show how many cans and bottles they collected in one day.



1. How many cans were there? ________

2. Which number sentence tells how many bottles there were? Draw a line under the correct answer.

   4 + 3 = _____
   3 X 4 = _____
   6 + 5 = _____

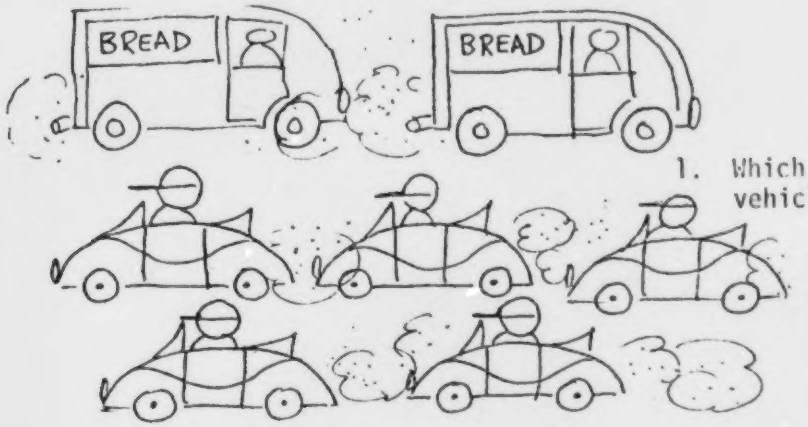
3. How many more cans than bottles were there? ______

4. If the recycling center paid the children $.25 for all the bottles and $.17 for all the cans, which number sentence shows how much money the children made all together?

   $.25 X $.17 = ______
   $.25 - $.17 = ______
   $.25 + $.17 = ______
   $.25 + $.17 = ______

Name ______________________________

Directions: Here are some things that cause air pollution. Use the pictures to answer the questions. Do the work and draw a line under the correct answer.

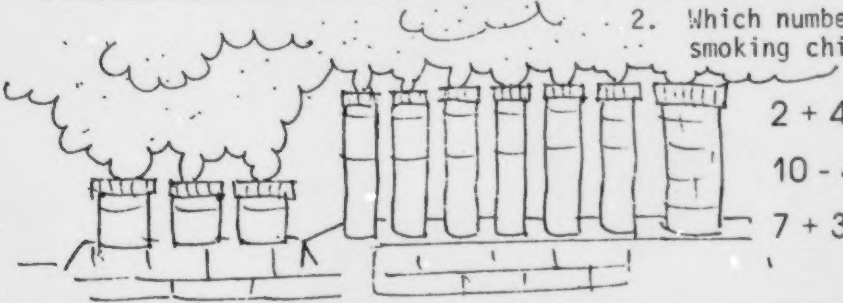


1. Which number sentence tells how many vehicles there are all together?

5 - 2 = ________

5 + 5 = ________

5 + 2 = ________

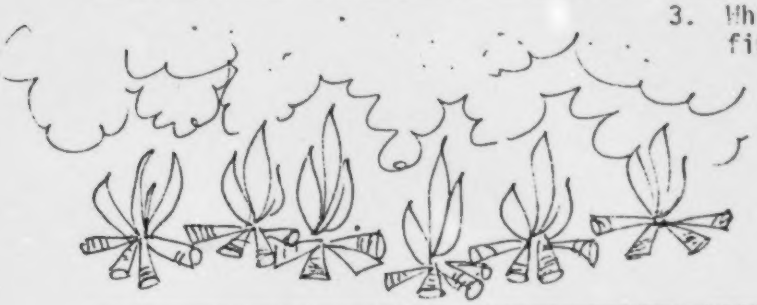


2. Which number sentence tells how many smoking chimneys there are all together?

2 + 4 = ________

10 - 4 = ________

7 + 3 = ________

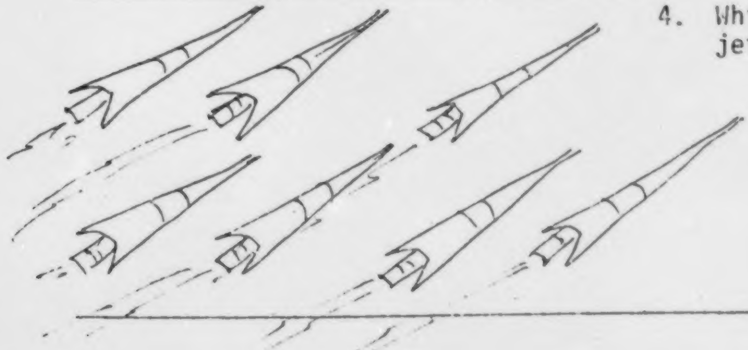


3. Which number sentence tells how many fires there are all together?

3 x 2 = ________

5 + 2 = ________

9 - 4 = ________



4. Which number sentence tells how many jet planes there are all together?

3 x 4 = ________

9 - 2 = ________

7 + 1 = ________

Name ______________________________

The Recycling Club at John Muir School has made money by saving aluminum cans, newspapers, bottles, and even rags and cardboard. They would like to know how much money they have made this month.

Directions: Change the number words to numerals. Add the amounts to find out how much money they have made.

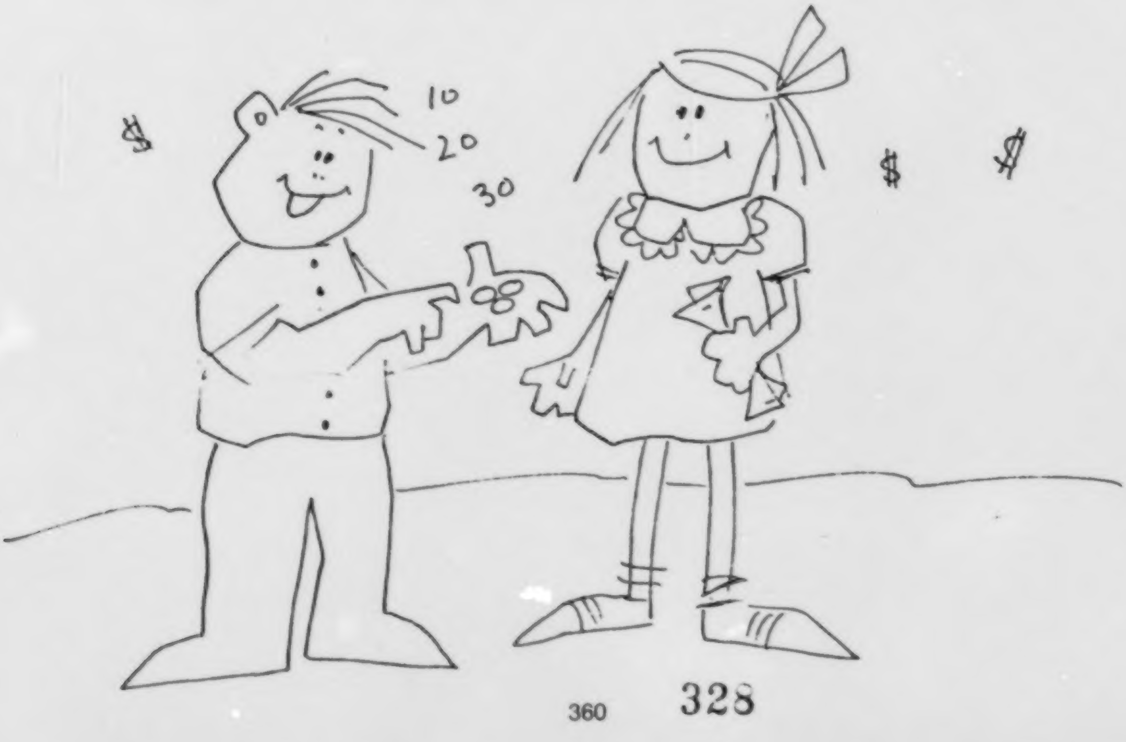
From collecting newspapers:
Two dollars, four dimes and five pennies $2.45

From saving aluminum cans:
One dollar, eight dimes and one nickel __________

From no-deposit bottles:
Four dollars, two dimes and nine pennies __________

From rags and cardboard:
One dollar, three dimes and one nickel __________

All together they have made: __________



Name ______________________________

Directions: Circle all the even numbers.

1 2 3 4 5 · 6 7 8 9 10 11 · 12 13 14 15 16

Follow the directions of each problem to read the energy message below.

1. On the first space, if 4 is an even number, write **Water**. If not, write **Rocks.**
2. On space 2, if 11 is an odd number, write **wind**. If not, write **in**.
3. On space 3, if 6 is an odd number, write **your**. If not, write **and**.
4. On space 4, if 13 is an odd number, write **sun**. If not, write **head**.
5. On space 5, if 15 is an even number, write **this**. If not, write **were**.
6. On space 6, if 14 is an even number, write **the**. If not, write **is**.
7. On space 7, if 9 is an odd number, write **first**. If not, write **not**.
8. On space 8, if 14 is an odd number, write **the**. If not, write **kinds**.
9. On space 9, if 2 is an even number, write **of**. If not, write **right**.
10. On space 10, if 7 is an odd number, write **energy**. If not, write **answer**.
11. On space 11, if 12 is an odd number, write **try**. If not, write **used**.
12. On space 12, if 8 is an even number, write **by**. If not, write **once**.
13. On space 13, if 16 is an odd number, write **more**. If not, write **people**.

________________, ________________, ________________, ________________
1 2 3 4

________________ ________________ ________________ ________________ ________________
5 6 7 8 9

________________ ________________ ________________ ________________.
10 11 12 13

329

Name ________________________

Directions: Use the chart to answer the questions below.

Animals move at different speeds for different reasons. A cheetah can run very fast to catch another animal for food. A snail crawls very slowly over a leaf to look for its food.

How Fast Can These Animals Go?

Lizard	18 mph. (miles per hour)
Cheetah	63 mph.
Pronghorn antelope .	55 mph.
Ostrich	30 mph.
Dolphin	25 mph.

1. Write the name of the fastest animal. ________________________

2. How much faster is the ostrich than the dolphin? ________________

3. How much faster is the pronghorn antelope than the lizard? __________

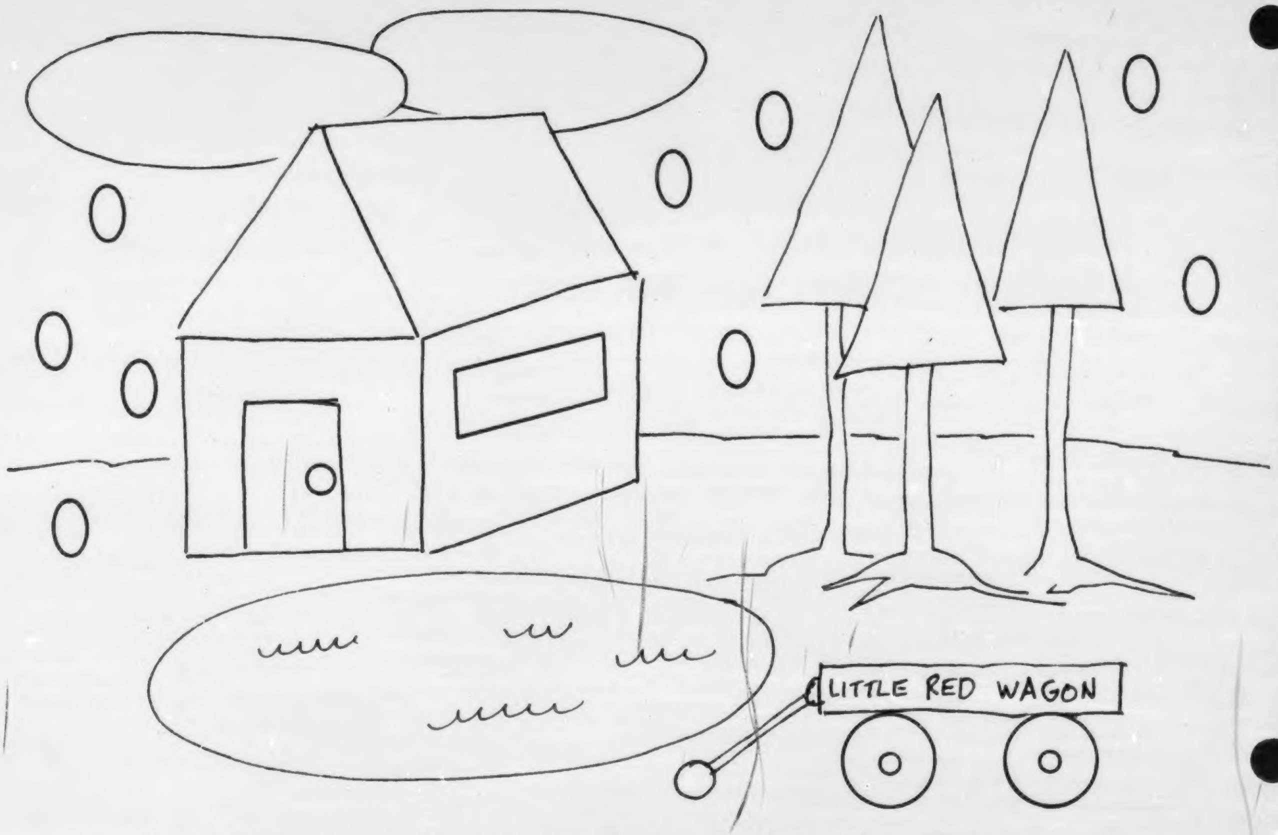
4. How much faster is the cheetah than the pronghorn antelope? _________

5. Could the cheetah catch the dolphin? __________ Why or why not?

____

ZIP!
HURRY!
RUSH!

Name ______________________________



Find the things that are shaped like circles. Color them yellow.
Find the things that are shaped liked triangles. Color them green.
Find the things that are shaped like squares. Color them brown.
Find the things that are shaped like rectangles. Color them red.
Find the things that are shaped like ovals. Color them blue.

The blue things are part of the water cycle.
Write the names of the things you colored blue.

____

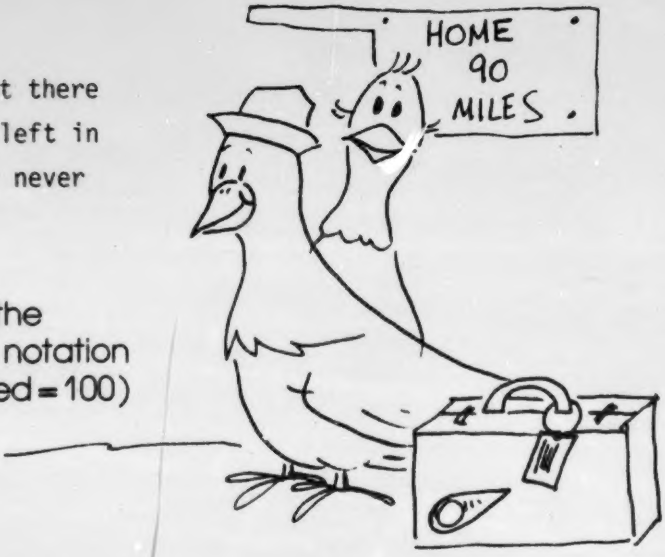
____

____

Name ______________________________

When an animal is extinct, it means that there aren't any more of that kind of animal left in the world. They have all died and will never be seen alive again.

Directions: Read the story. Change the underlined numbers from expanded notation to standard notation. (ex. one hundred = 100)



The Passenger Pigeon

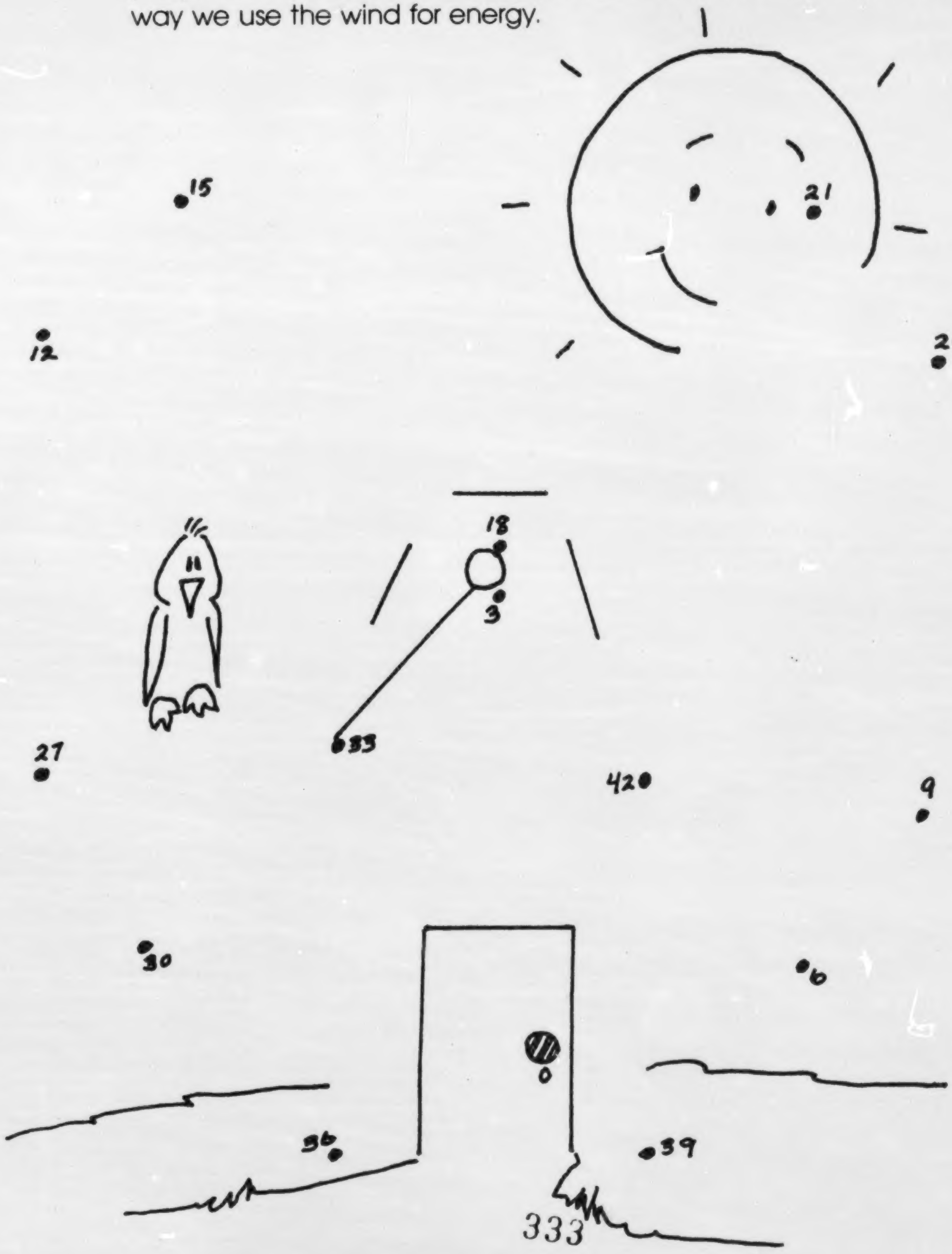
The most common bird to be killed by man was the passenger pigeon. Large numbers of these birds were killed mostly for food. One store in New York handled about eighteen thousand (___________) birds a day in the year one thousand eight hundred fifty five (________). By one thousand eight hundred seventy nine (_______), almost five thousand (_________) men worked as pigeon hunters. In this year over one billion birds were killed in just one state.

The last passenger pigeon nest was found in one thousand eight hundred ninety four (________). The last passenger pigeon in the world, "Martha", died on September 1, one thousand nine hundred fourteen (__________) in the Cincinnati Zoo.

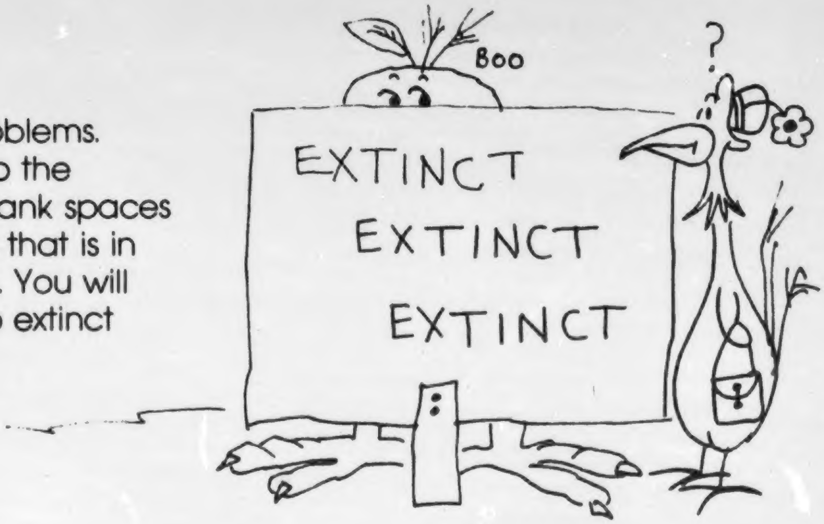
No one will ever see passenger pigeons flying wild again. They are an extinct animal.

Name ______________________________

Directions: The sun, water and wind were the first kinds of energy used by people. Count by 3's to connect the dots and you will find one way we use the wind for energy.


15
21
12
24
18
3
33
27
42
9
30
6
0
36
39

Name ______________________________



Directions: Do the problems. Match your answers to the numbers under the blank spaces below. Write the letter that is in the box on the space. You will find the names of two extinct animals.

546 + 218 764 B	328 + 138 E	786 + 104 D	422 + 168 M	379 + 619 R	622 + 169 W
447 + 326 S	817 + 149 O	525 + 335 K	188 + 206 A	673 + 117 I	638 + 148 N

___	___	___	___		B	___	___	___
890	966	890	966		764	790	998	890

and the

___	___	___		___	___	___	___
773	466	394		590	790	786	860

Name ______________________

Jerry lives on a small farm. Houses have been built on the lands around the farm. Jerry has made a chart to show how many animals lived near the farm before the houses were built. His chart also shows how many of these animals are living near the farm now.

Directions: Jerry wrote the numbers as Roman numerals. His chart would be easier to read if the numbers were written in standard notation. Change the Roman numerals to standard notation. Write the numerals on the blank spaces.

ANIMALS NEAR THE FARM

ANIMAL	Before the houses were built		After the houses were built	
Beavers	XX	20	XI	11
Coyotes	VI	______	II	______
Raccoons	XII	______	VIII	______
Rabbits	IX	______	XVI	______
Deer	V	______	I	______
Field Mice	VIII	______	XVIII	______
Foxes	XIV	______	III	______

Are there more of some animals since the houses were built?

Can you think of a reason why?

Name ______________________________

Directions: The number in each sentence is written in expanded notation. Write the standard notation for each underlined number on the line after each sentence.

1. Each year, every man, woman and child in the United States throws away about one ton of paper, cans, bottles and garbage. ________

2. The thirty six children in Mrs. Jones class are starting a recycling center to help get rid of trash. ________

3. John has already saved forty four cans to recycle. ________

4. Barbara has collected ninety seven bottles. ________

5. The class has more than seventy two stacks of newspapers. ________

6. Three hundred average size books can be printed on paper made from one tree. ________

7. Seven children will take the newspapers to a paper company. ________

8. There are more than twenty three recycling centers in the Santa Clara Valley. ________

9. Sixteen people work at the center in Cupertino. ________

10. The rest of the four hundred eighty two students at the school would like to take part in the recycling center. ________

Name ____________________

Directions: Write the number that is missing in each pattern.

1. 10 12 14 16 ____ This is the last letter.

2. ____ 2 3 4 5 This is the second letter.

3. 5 10 15 ____ 25 This is the third letter.

4. 8 12 ____ 20 24

5. 10 20 30 ____ 50

6. 3 ____ 7 9 11 This is the fourth letter.

7. 3 6 9 12 ____

8. 13 ____ 33 43 53 This is the first letter.

Use this code to find the letters to answer the question.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P	Q	R	S	T	U	V	W	X	Y	Z				
16	17	18	19	20	21	22	23	24	25	26				

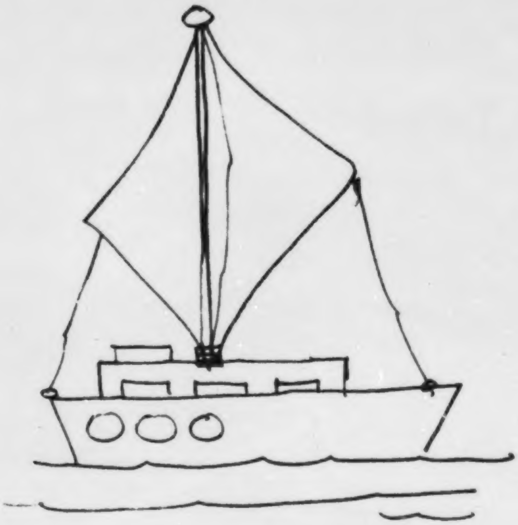
What is our most important resource? ____ ____ ____ ____ ____

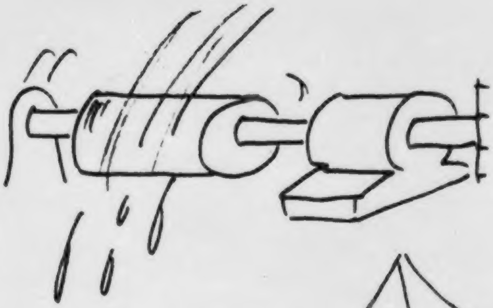
Name ______________________________

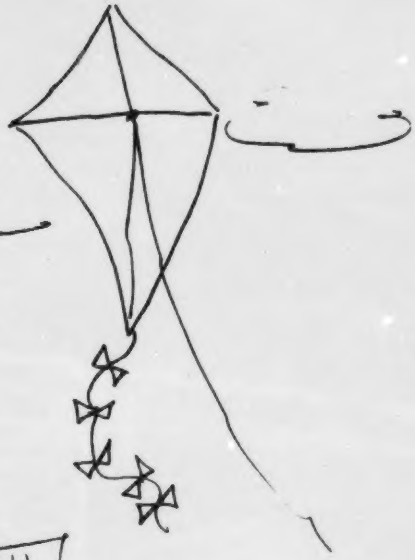
ENERGY

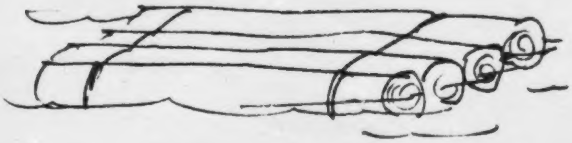
Energy is what makes things go. The sun, wind, and water were the first three kinds of energy used by people.

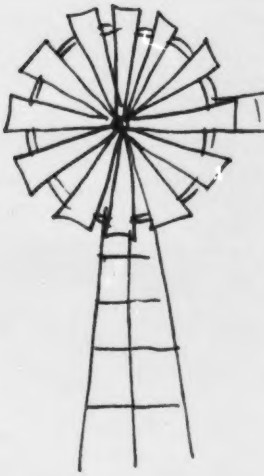
Directions: Write 'wind' or 'water' under the pictures below to show which source of energy is being used.









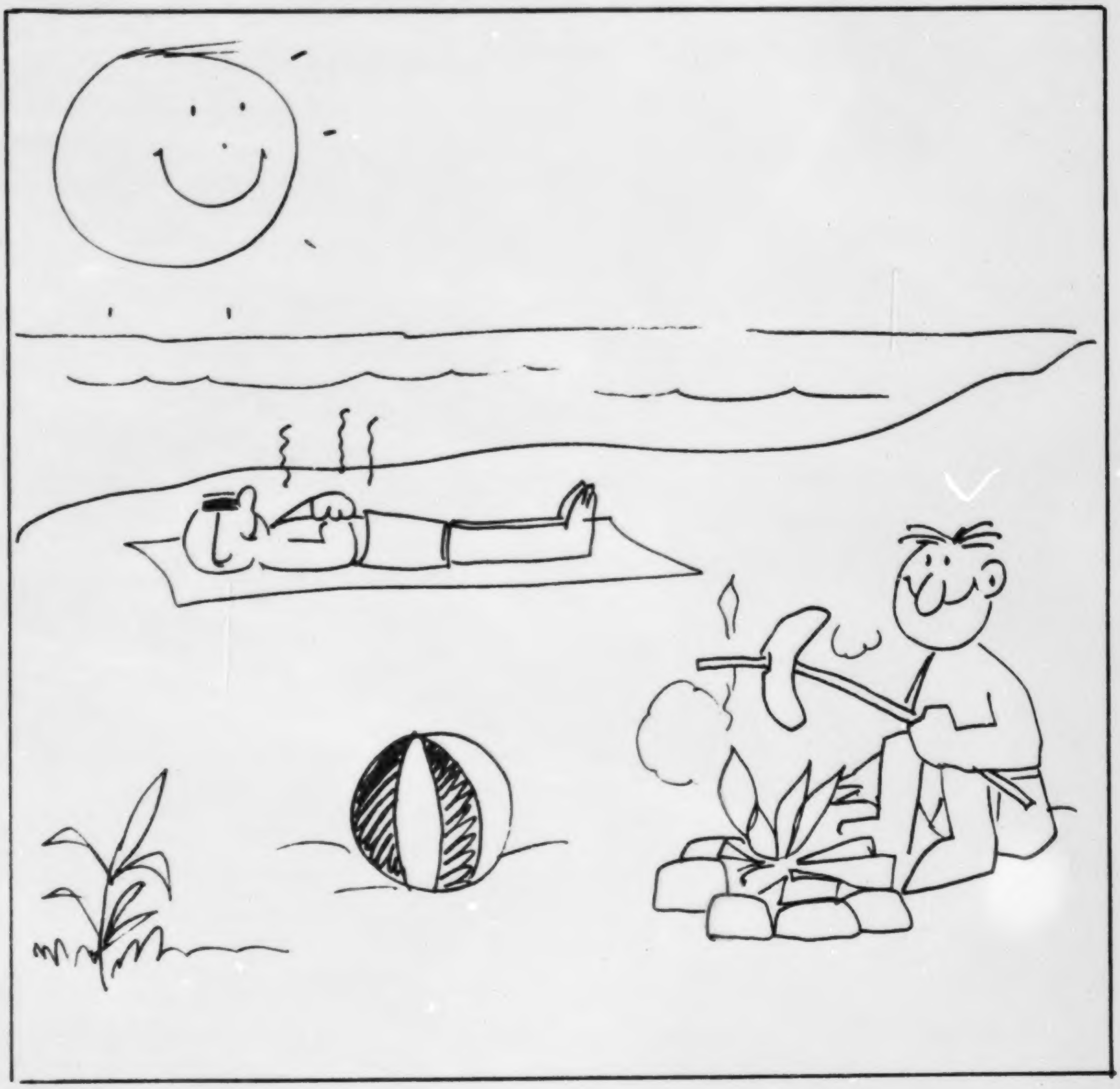


Name ______________________________

ENERGY FROM THE SUN

Most of our energy comes to us from the sun. This is called solar energy. The sun warms the earth and gives us light. Plants need the sunlight to grow and make food. Animals need the food to live.

Directions: Color all the things in the picture that are using or have used the sun's energy.



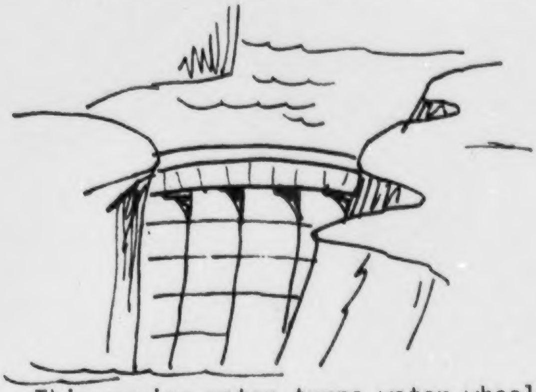
339

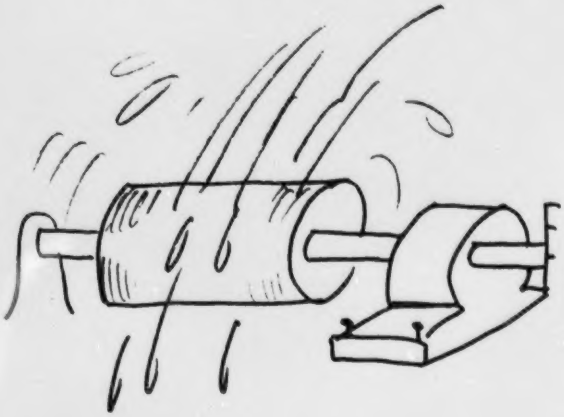
Name ____________________

HYDRO POWER

Moving water can light our houses, cook our food, and help us to do many other things. The moving water can be used to make electricity. This is called hydro power.

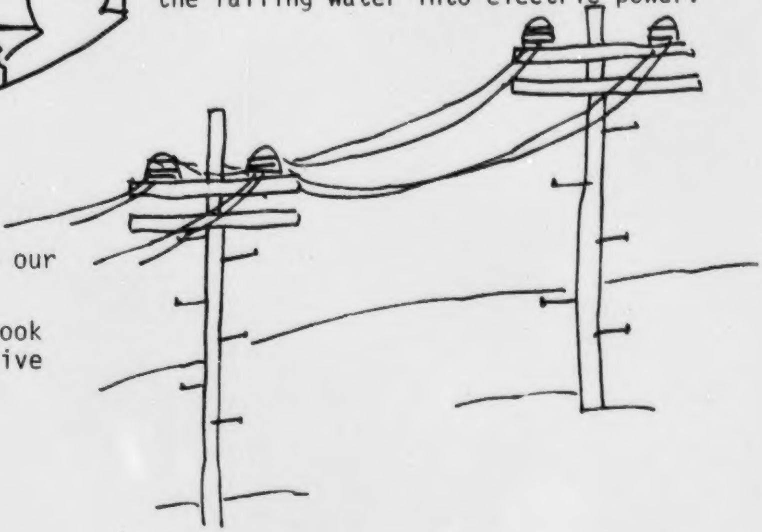
First, a wall is built across a river.
It is called a dam.
Water builds up behind the dam.
Some of the water is allowed to flow over or through the dam.





This moving water turns water wheels that run special machines called turbines or generators.

These machines change the energy of the falling water into electric power.



The electric power comes to our homes over wires.

We use the electricity to cook our food, keep us warm, and give us light.

Directions: Write the names of things in your home that use electricity for power.

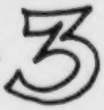
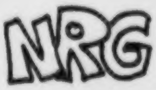
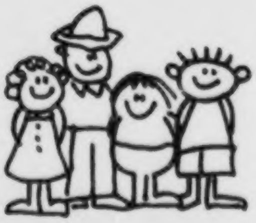
____________________ ____________________

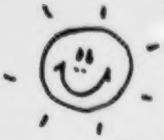
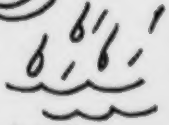
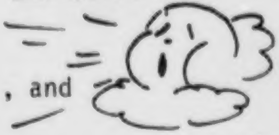
____________________ ____________________

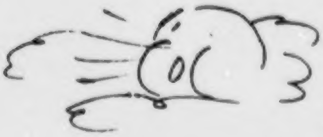
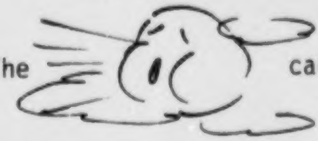
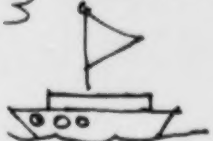
____________________ ____________________

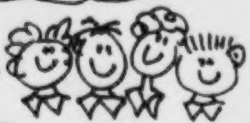
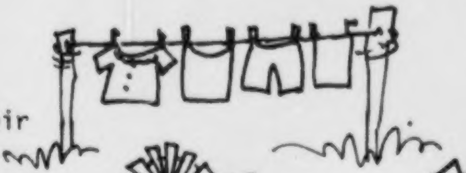
Name ____________________

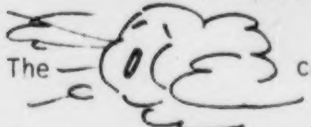
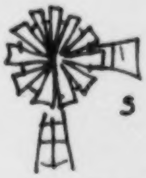
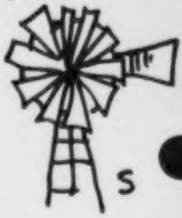
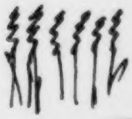
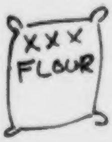
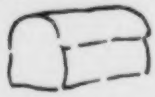
Directions: Use the pictures to read the story.

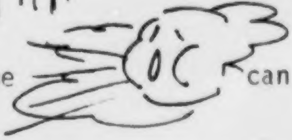
The first  kinds of  used by  were

the , , and .

 is moving air. The  can move people from place to place in s.

It can help  dry their .

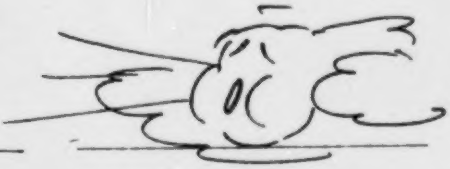
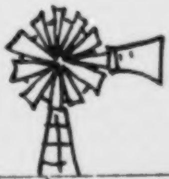
The  can be used to turn s. The s grind  to make  to make .

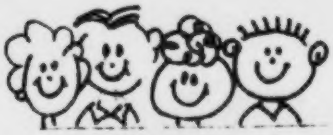
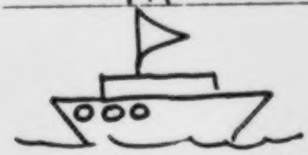
The  can help us in many ways.

- -

Put the letter by the picture.

A. wind B. people C. windmill D. sailboat

____  ____ 

 ____  ____

341

Name ______________________________

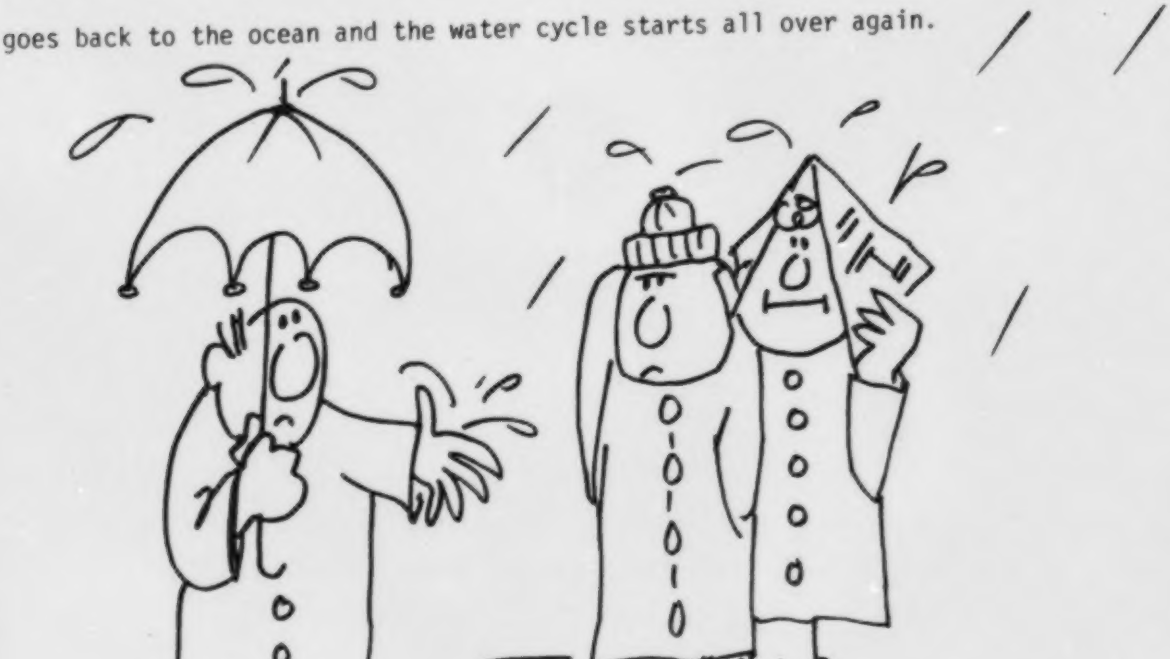
Directions: Use these words to fill in the blank spaces in the story.

clouds drink oceans sun rain
rivers sewers

- -

The Water Cycle

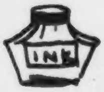
Most of the water on the earth is in the ______________________. The water is salty there. Every day, the _________________ shines on the water and heats it up. Some water evaporates and becomes ______________________. These move over the land and fall as ___________________ and snow. The water runs over the land and into ____________________. People can use this fresh water to __________________, wash, and grow plants. After the people use the water, some of it goes into _____________________. Then the water goes back to the ocean and the water cycle starts all over again.

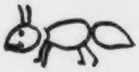


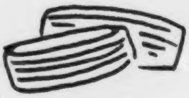
Name ____________________

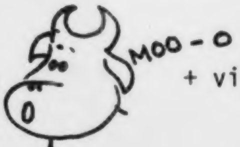
Directions: Use pictures and letters to complete each sentence.
When you come to a + or - sign, add or subtract the letters or pictures shown.
Write the words on the blank spaces.

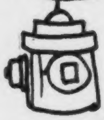
WATER

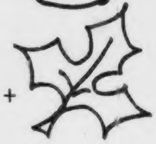
1. Animals need water to dr +  . ____________________

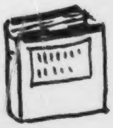
2. Water is needed to grow pl +  + s. ____________________

3. We use water for fighting f +  - t. ____________________

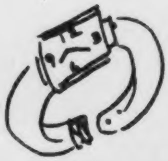
4. We can get energy or power from  + ving water. ____________________

5. This kind of energy is called  -ant + o power. ____________________

6. We use water to keep things c +  - f + n. ____________________

7. People can travel on water by using  - ok + cats - c.

____

8. Our most important natural resource is  - ch + er.

____

Name ______________________________

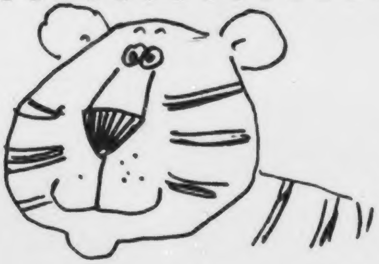
Endangered Animals

Some animals are endangered. This means that there aren't many left.

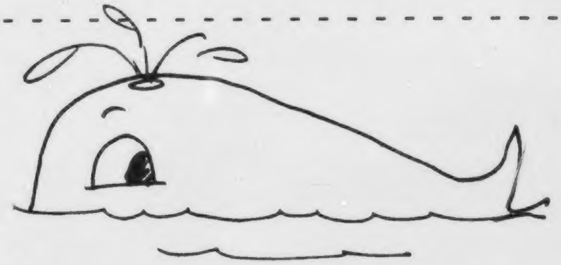
Some animals are endangered because the weather changes, they can't get enough food or water, or their habitat is destroyed. Sometimes, people kill too many animals and they become endangered.

Directions: Write the names of these endangered animals on the spaces under their picture.

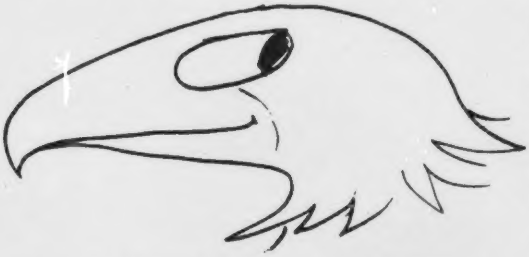
Blue whale	Timber wolf	Tiger
Brown pelican	Bald eagle	Panda bear



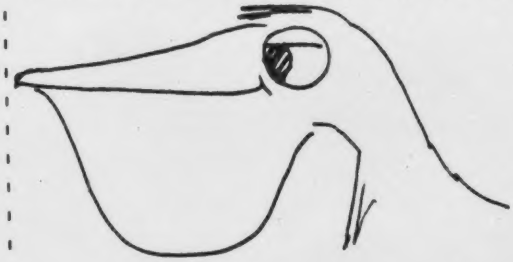
____



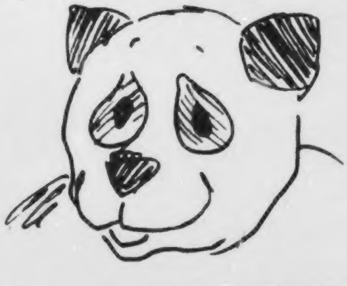
____



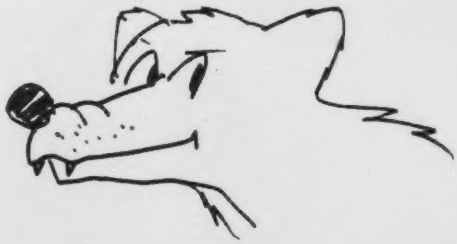
____



____



____



____

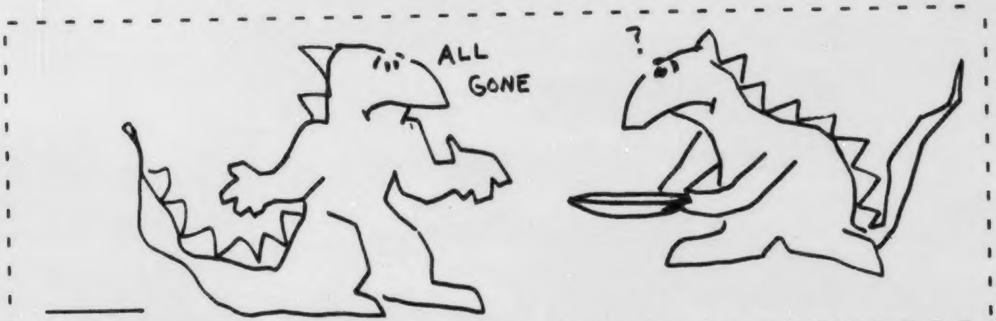
Name ____________________

EXTINCT ANIMALS

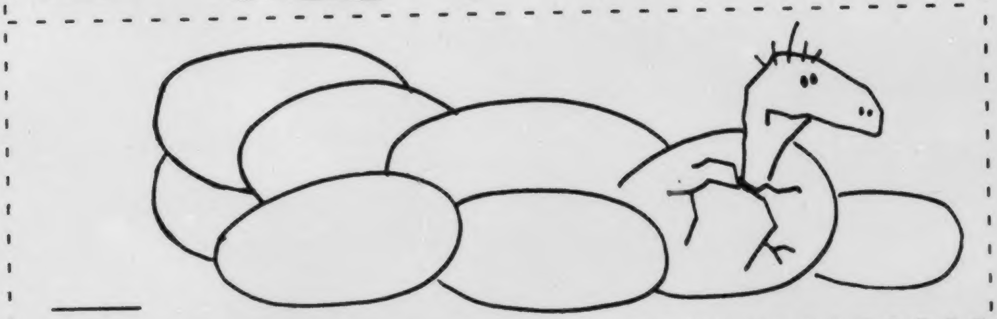
Animals or plants that once lived on the earth, but are no longer alive are called extinct. Dinosaurs are a good example of animals that are extinct. Dinosaurs were large lizards that lived in warm places. They needed lots of food, water, and space to live.

Directions: Match the picture to the sentence that tells why dinosaurs became extinct. Write the numeral of the sentence under each picture. Color the pictures.

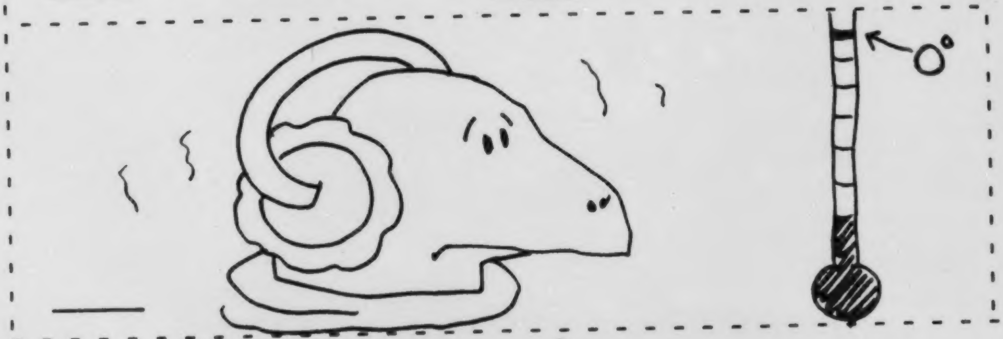
1. There was not enough food or water.
2. The climate became too cold.
3. Few baby dinosaur eggs hatched.



____



____



____

Name ______________________________

ADAPTATION

Plants and animals must be able to adapt to live. This means that if their
4

habitat changes, the plants and animals must adapt, or change, too.
9

Some animals adapt by changing their habitat. For example, some birds live
6 2

best in places where the weather is warm. If the weather changes and becomes cold,
3

they can fly far away to another warm place.
10

Some animals adapt by changing what they eat. Seagulls can eat fish, but if
5

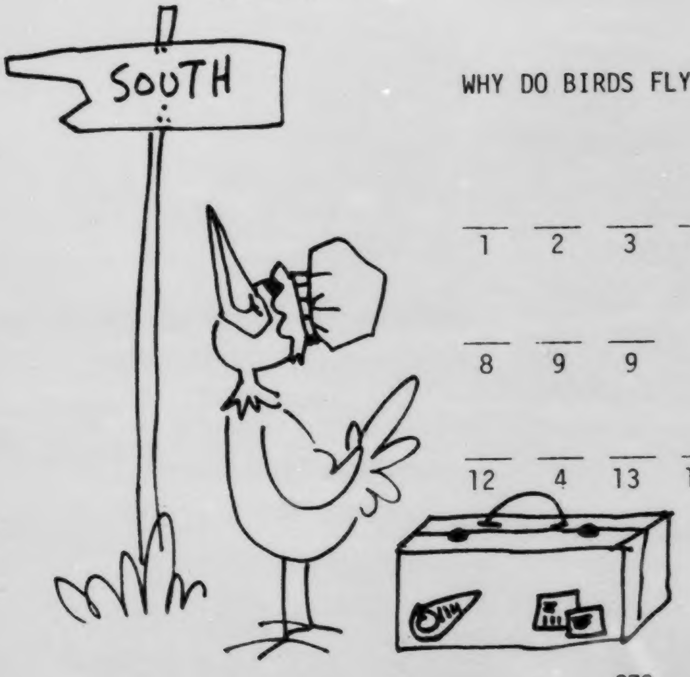
there are no fish, they can eat many other things, too.
11

People can adapt by using their brains and hands to build or make things.
1 14

If the weather gets cold, people can put on a coat or build a warm house.
7 12

People can adapt or change more than any other animal.
8 13

Directions: Find the answer to the silly riddle.
Use the story to find letters that match the numerals under the spaces.



WHY DO BIRDS FLY SOUTH IN THE WINTER?

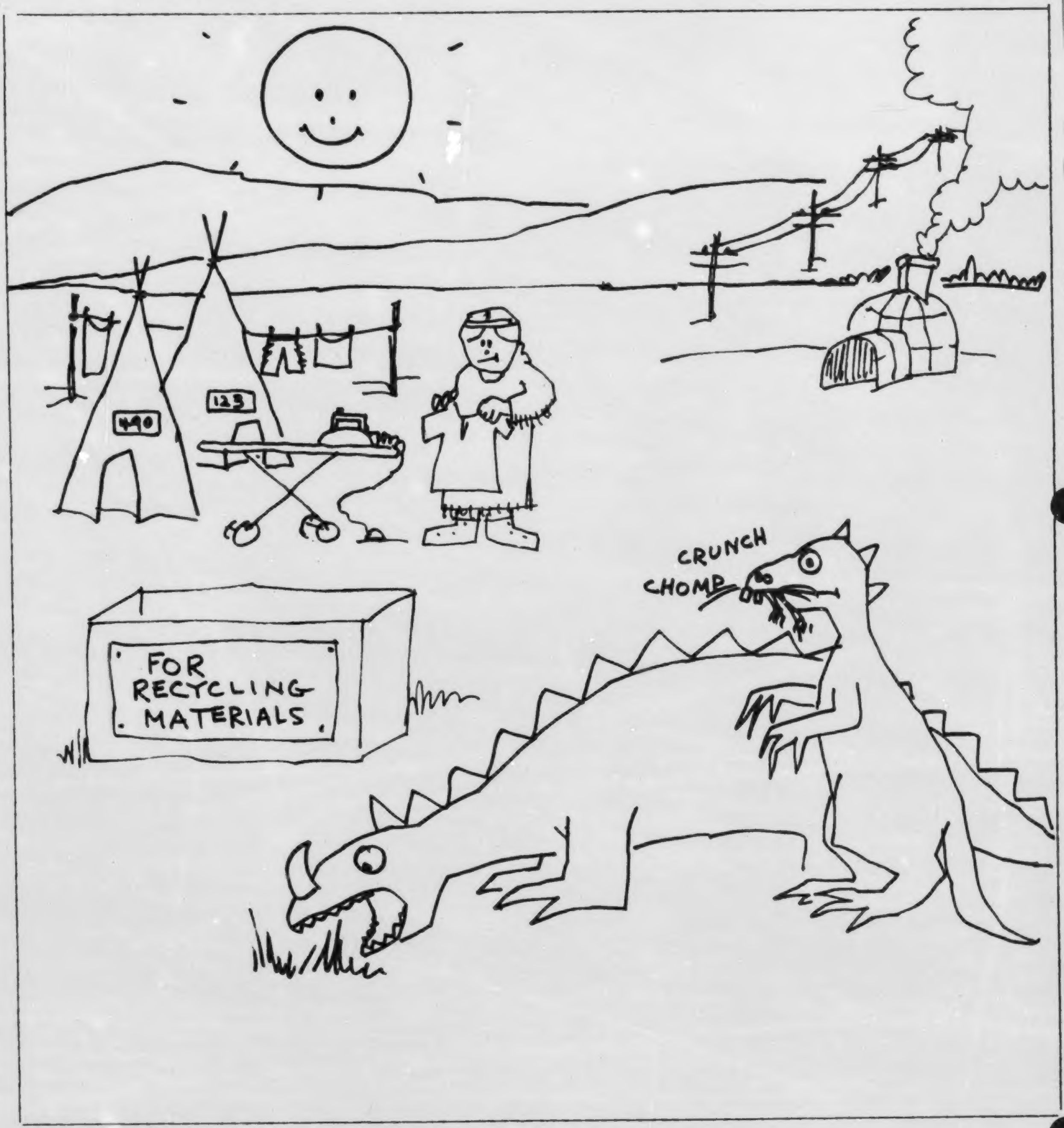
___ ___ ___ ___ ___ ___ ___   ___ ___ ' ___
1 2 3 4 5 6 2   7 8 6

___ ___ ___   ___ ___ ___   ___ ___
8 9 9   10 4 11   8 9

___ ___ ___ ___ !
12 4 13 14

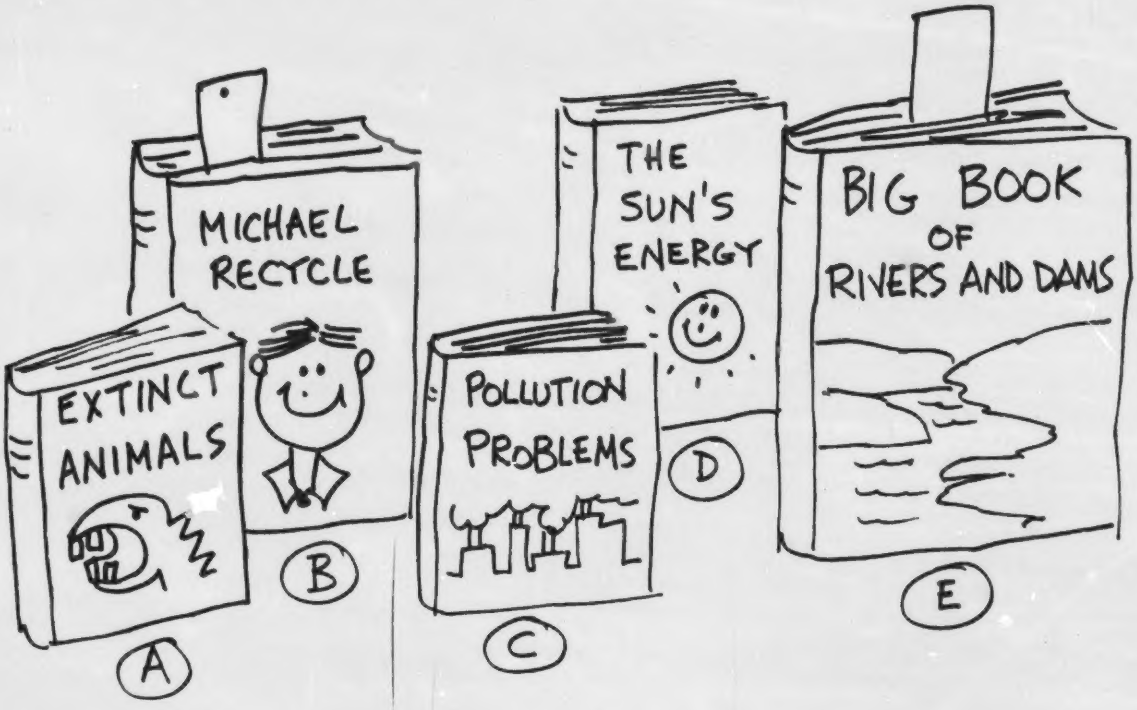
Name ______________________________

Directions: Here is a picture of an Indian village in early California. Make an X on all the things in the picture that are wrong. Do you know why?


490
123
CRUNCH
CHOMP
FOR RECYCLING MATERIALS

347

Name ______________________________


MICHAEL RECYCLE
THE SUN'S ENERGY
BIG BOOK OF RIVERS AND DAMS
EXTINCT ANIMALS
POLLUTION PROBLEMS
A
B
C
D
E

Directions: Write the letter of the book you would read to find the answers to the following questions.

1. How do you use old aluminum cans to make new ones? ________
2. What happened to the passenger pigeon? ________
3. What is solar power? ________
4. How are litter and trash spoiling our environment? ________
5. How do people use water to make electricity? ________
6. Where have all the dinosaurs gone? ________
7. How can old newspapers save our trees? ________
8. Why does smog hurt your eyes? ________

Name ______________________________

Directions: Use this code to read the message.

A	B	C	D	E	F
2	4	6	8	10	12
G	H	I	J	K	L
14	16	18	20	22	24
M	N	O	P	Q	R
26	1	3	5	7	9
S	T	U	V	W	X
11	13	15	17	19	21
Y	Z				
23	25				

Good luck.

13 16 2 13   5 2 5 10 9   18 11   26 2 8 10   12 9 3 26

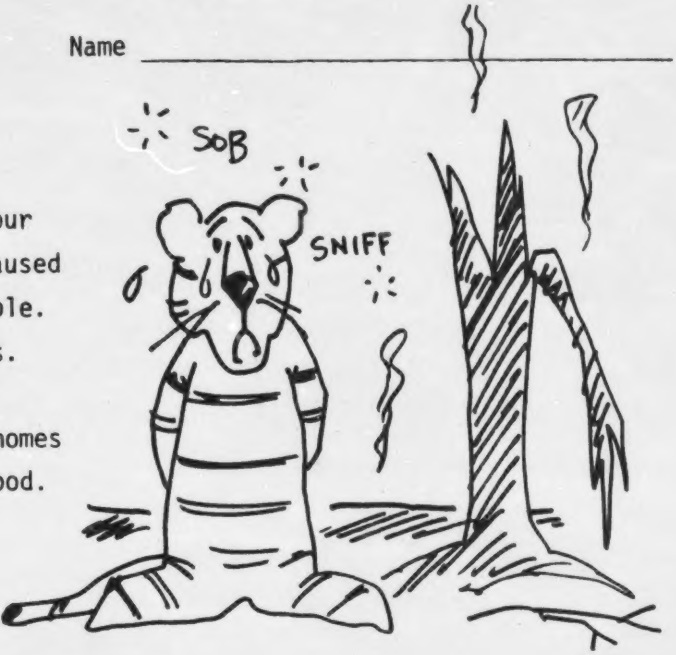
13 9 10 10 11   18 11   11 3 26 10 13 16 18 1 14   19 10

2 24 24   22 1 3 19   11 3,   18 12   19 10   19 2 11 13 10

3 15 9   5 2 5 10 9,   26 3 9 10   13 9 10 10 11

19 18 24 24   16 2 17 10   13 3   14 3!

Name ____________________



FOREST FIRES

Fire can destroy large parts of our environment. Some forest fires are caused by nature, but most are caused by people. A forest fire kills animals and plants. When there is a forest fire, even the animals that can run away lose their homes and the places where they get their food.

Directions: Read the newspaper stories. Draw a line under the sentence that tells how the fire started. Write people or nature on the spaces to show who caused the fire.

FIRE BURNS 500 ACRES

Forest rangers believe that the fire was started by a campfire that was left burning. Five hundred acres were destroyed by the fire.

____

FOREST FIRE UNDER CONTROL

The fire in Smokey Mountain Park has been put out. Firemen think it was caused by a burning cigarette thrown from a car.

____

FIRE IN NATIONAL FOREST

Lightning struck a large tree in the Green Pines forest. The tree burst into flames. The fire was first seen by Rangers in the lookout station on White Mountain.

____

RANGERS PUT OUT FIRE

A broken glass bottle and the heat of the sun started the fire in Blue Ridge Park. The fire was quickly put out by the fast action of the Park rangers.

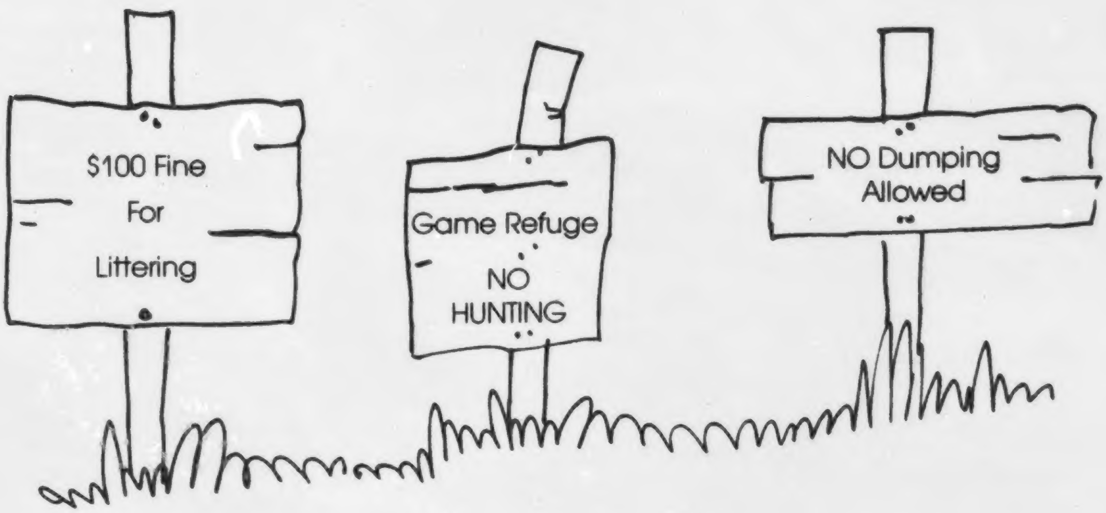
____

Name ______________________________

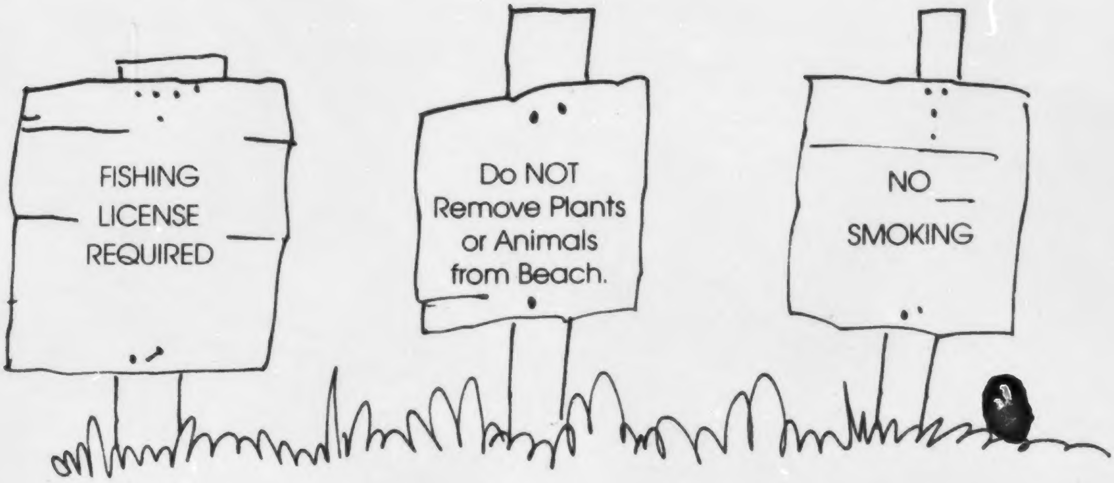
HELPING OUR ENVIRONMENT

Many people care about our environment. They have made laws to protect plants and animals that are endangered and to stop pollution.

Directions: Under the signs below, put a '1' if the law is to protect plants or animals. Put a '2' if the law is to stop pollution of the air, water, or land.

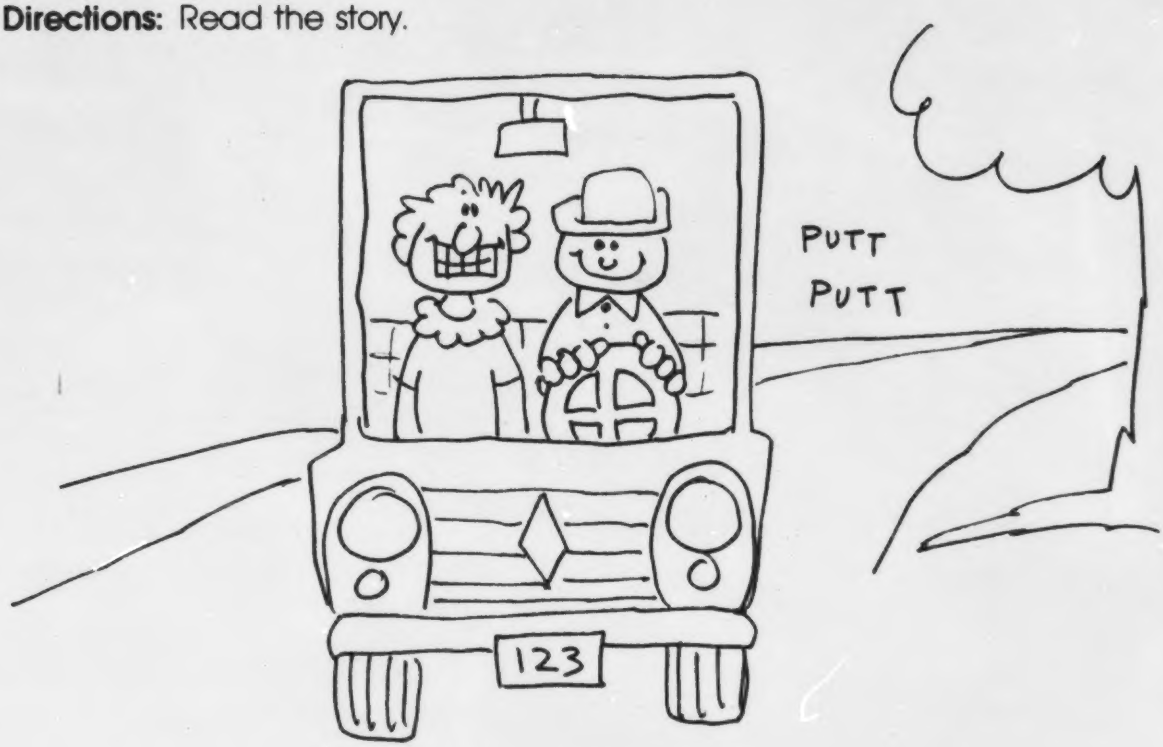

$100 Fine For Littering
Game Refuge NO HUNTING
NO Dumping Allowed

____ ____ ____


FISHING LICENSE REQUIRED
Do NOT Remove Plants or Animals from Beach.
NO SMOKING

____ ____ ____

Directions: Read the story.



The Trip to Green Mountain

Joe and Betty were going camping on Green Mountain. They left their house early in the morning because there were many things to see along the way.

First, they drove over the Golden Gate Bridge. They saw many sailboats in the water below. Next, they passed many new houses that were being built on the hillsides.

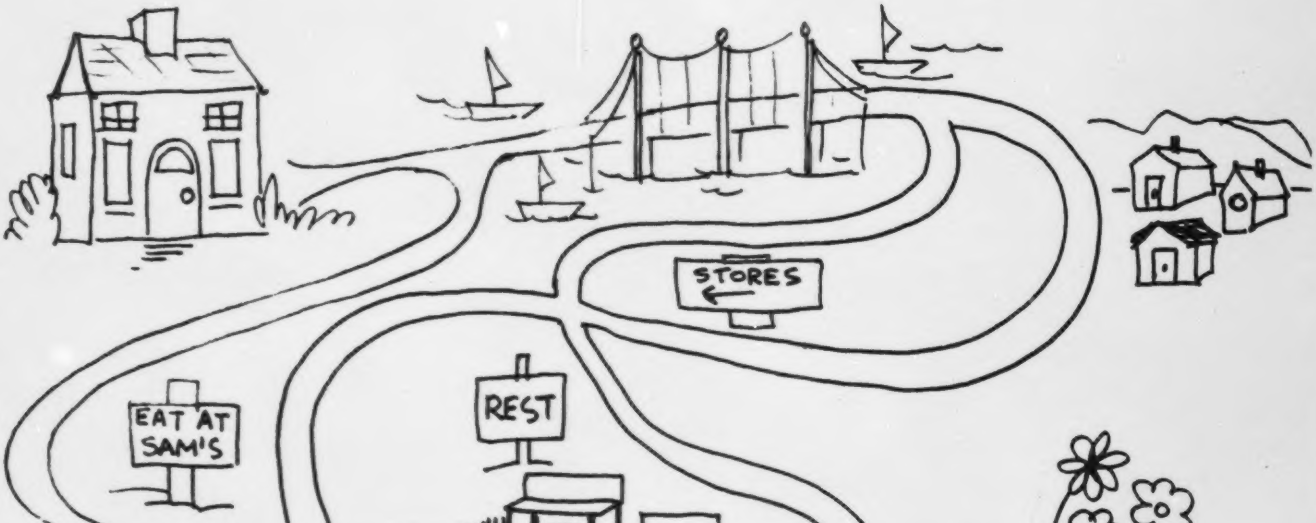
Joe was beginning to get hungry. He saw a sign that showed there were many stores along one of the roads. But Betty had packed a lunch to eat on the way, so they did not go that way. Soon, they came to a roadside rest stop where they ate their lunch. After lunch, they began to drive again. Once, Betty asked Joe to stop the car so that she could take pictures of some pretty wildflowers growing near the road.

A few hours later, Betty and Joe stopped at Hetch Hetchy to see the large dam that provides water and electricity for the people who live far away in San Francisco.

As they began to see more and more trees, they knew they were getting closer to the Green Mountain campground. Soon, they were there.

Name ______________________

Directions: Use the story to trace the roads that Betty and Joe took to get to the Green Mountain campground.


STORES
EAT AT SAM'S
REST
WELCOME TO GREEN MOUNTAIN

Write the names of three things Joe and Betty passed on the way that were made by people.

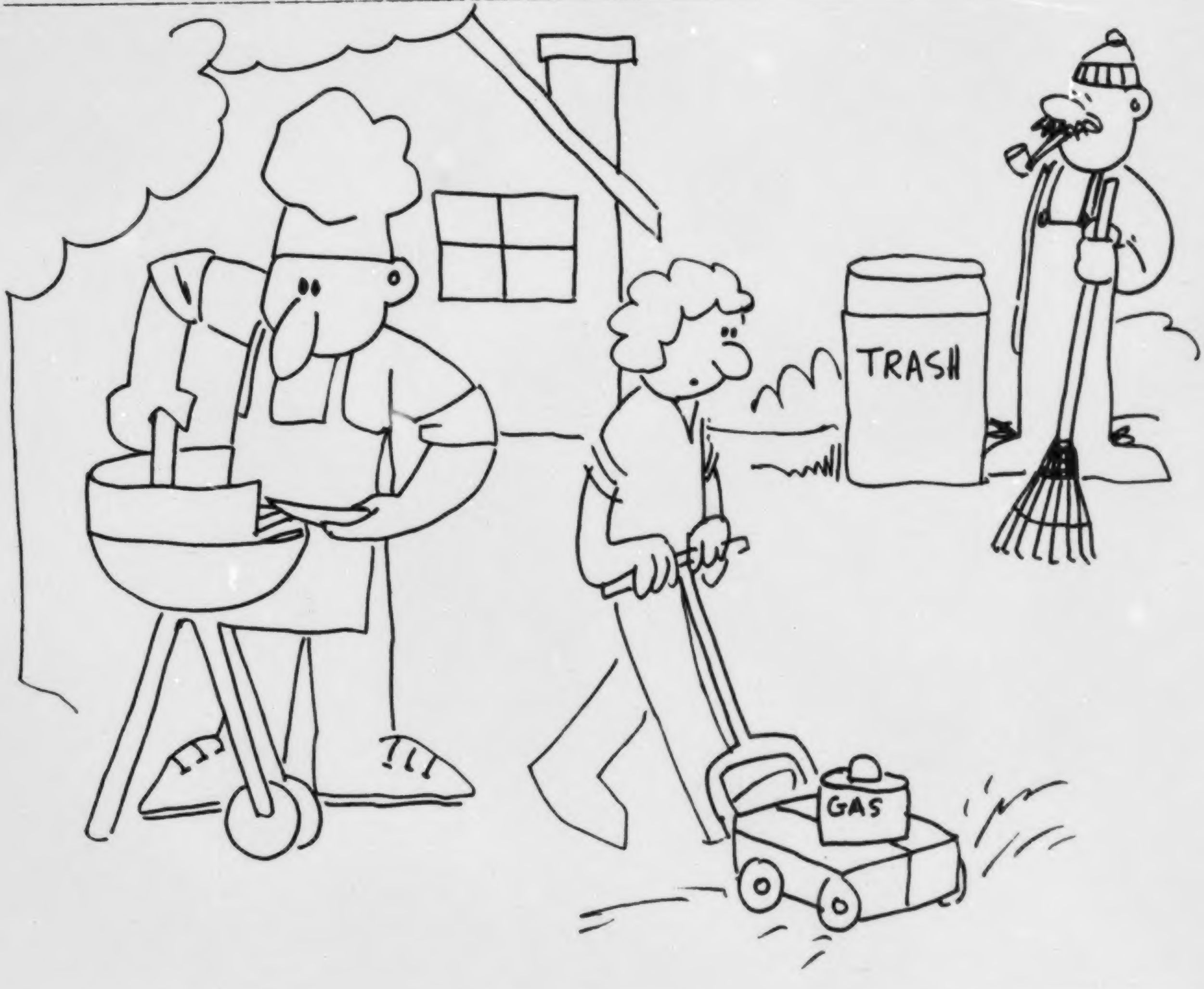
______________ ______________ ______________

Did these things change the environment?

Name ______________________

Air pollution is a problem for everyone.

Directions: Draw smoke coming from all the things in the picture that pollute the air.



What could you change to help keep our air clean?

____

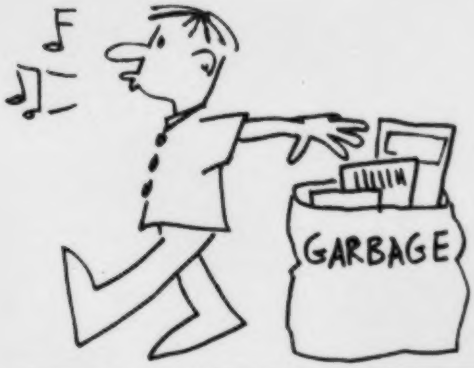
____

____

Name ____________________

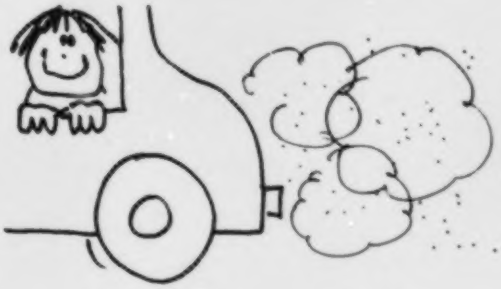
THINK! There are lots of ways you can help to get rid of pollution.

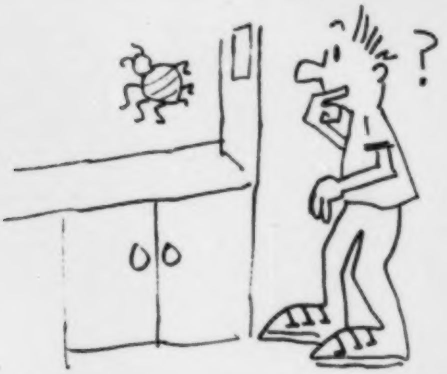
Directions: Read each story. Think of an answer for the question. Write it.



Rex bought three new comic books. They were fun to read. After he read them all, he threw them in the garbage can. This made more trash pollution. What elso could Rex have done with the comic books?

It was a warm and sunny day. Jackie wanted to go to Carolyn's house to play. Carolyn lived three blocks away so Jackie had her mother drive her there. This made more air pollution. What else could Jackie have done?





Russ saw a spider on the kitchen wall. He quickly caught the spider with a tissue and flushed them both down the toilet. This made more water pollution. What else could Russ have done with the spider?

Name ______________________________

Directions: Put an X on the word in each row that does not belong.

1. deer fox eagle bear
2. bridge dam highway volcano
3. dinosaur elephant passenger pigeon dodo bird
4. tiger panda raccoon timber wolf
5. yellow rain rivers clouds
6. wood paper oil cardboard
7. smog nature smoke dust
8. litter trash garbage earth
9. protect sugar save use wisely

Answer the question below.
Write the beginning letter of the crossed out words on the spaces.

Whose job is it to take care of our environment?

__ __ __ __ __ __ __ __ __

Name ______________________________

Here is a checklist of somethings you can do to help protect our environment. Add some of your own ideas in the bottom spaces.

Fill out the checklist by beginning with anything you think goes in the "easy, I'll do it" column. Then move on to the next column, and the next.

Compare your checklist with other people's. Where do you stand? Try doing the checklist again in a month. Have you changed? Remember, changing to even one good ecology habit is a start.

I can't	I don't want to	I might	I'll do it sometimes	Easy, I'll do it	
					walk instead of asking for a ride
					ride a bike instead of asking for a ride
					throw papers in trash cans
					use dishes instead of paper plates and paper cups
					save newspapers for recycling
					use the back of writing and drawing paper
					save envelopes and wrapping paper to use again
					save cans and bottles for recycling
					use plastic bags over and over
					avoid buying things in plastic containers or wrappers
					turn off all water faucets tightly
					fix drips and leaks
					don't let water keep running when you brush your teeth
					run dishwashers and washing machines only with full loads
					don't use the toilet as a wastebasket
					turn off lights when you're not using them
					plant trees
					fix things instead of throwing them out
					give outgrown clothes to someone smaller
					share books and games with your friends
					talk to people about ecology

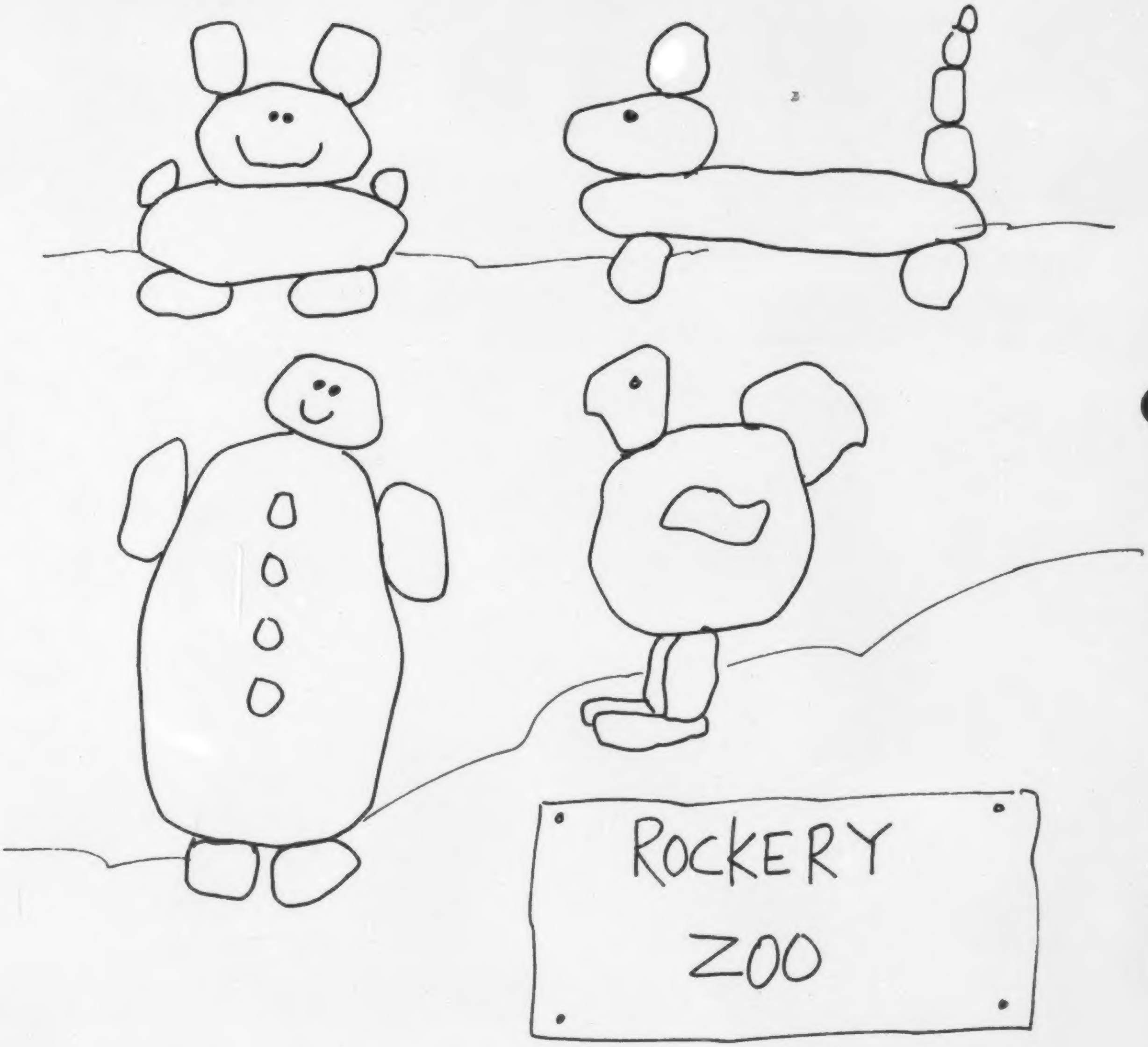
RELATED ACTIVITIES

The following pages are ideas for integrating conservation activities with areas of the curriculum other than language arts, math, social studies and science. These activities are samples of those included in the 'All Levels' Guide which is the seventh book of the Conservation For Children series.

The 'All Levels' Guide contains activities and ideas for art, music, growing plants, and classroom projects, as well as student and teacher bibliographies. The activities and ideas are applicable to many grade levels.

Rock Animals

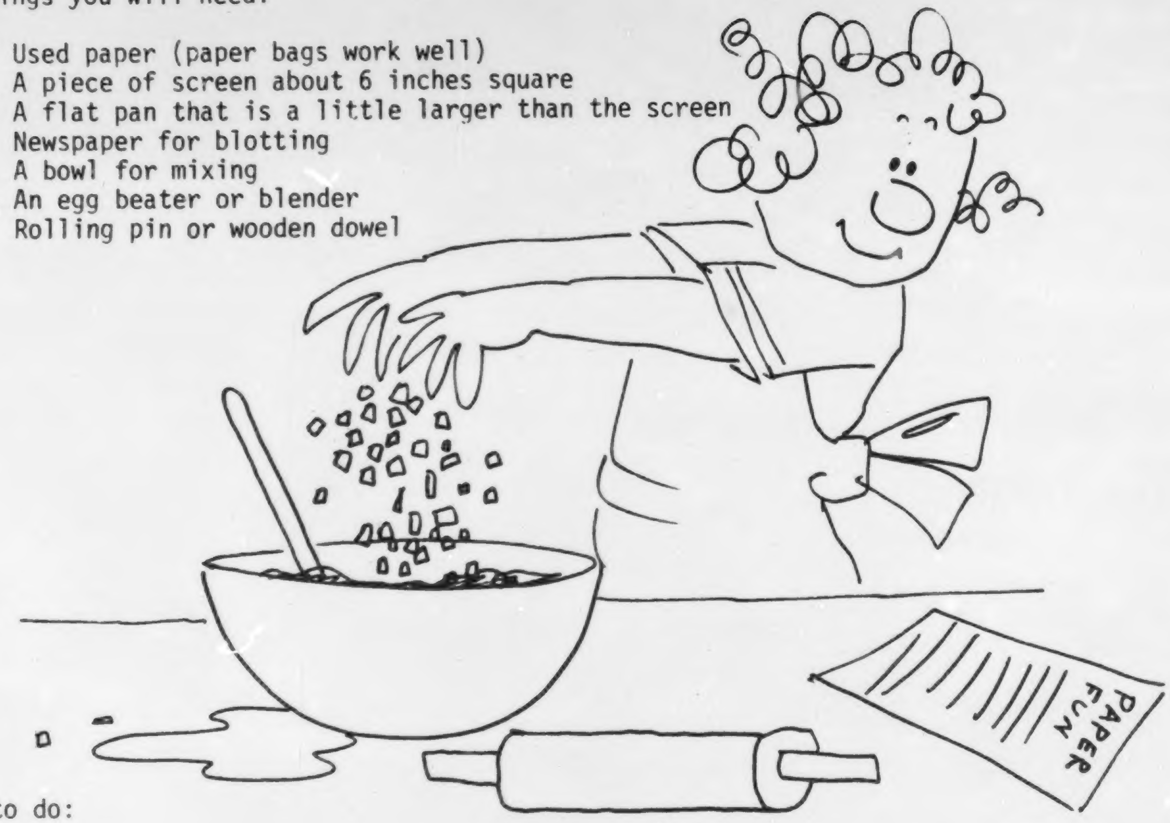
Gather small stones and pebbles of different shapes and sizes. Scrub them with soap and water and let them dry. Use the stones as different parts (bodies, eyes, ears, beaks, legs, heads, wings, tails, and so on) or the animal you want to make. Use white glue or contact cement to put the parts together. You can even give them color with some poster paint.



Making Recycled Paper

Things you will need:

- Used paper (paper bags work well)
- A piece of screen about 6 inches square
- A flat pan that is a little larger than the screen
- Newspaper for blotting
- A bowl for mixing
- An egg beater or blender
- Rolling pin or wooden dowel



What to do:

1. Tear the used paper into little tiny pieces. Add about two cups of hot water. Beat the paper and water with the beater or blender to make pulp.

2. Pour the pulp into the flat pan. Slide the screen into the bottom of the pan and move it around until it is evenly covered with pulp. Lift the screen out carefully. Hold it level and let it drain for a minute.

3. Put the screen, pulp side up, on the newspaper. Put more newspaper on top and use the rolling pin to squeeze out more water.

4. Carefully remove the top newspaper. Move the screen with the pulp to some dry newspaper to let dry. When the paper is almost dry, you can peel it off the screen. Let it dry thoroughly. You now have a piece of recycled paper. Use it for stationery, a picture, or a beautiful background for a leaf print.

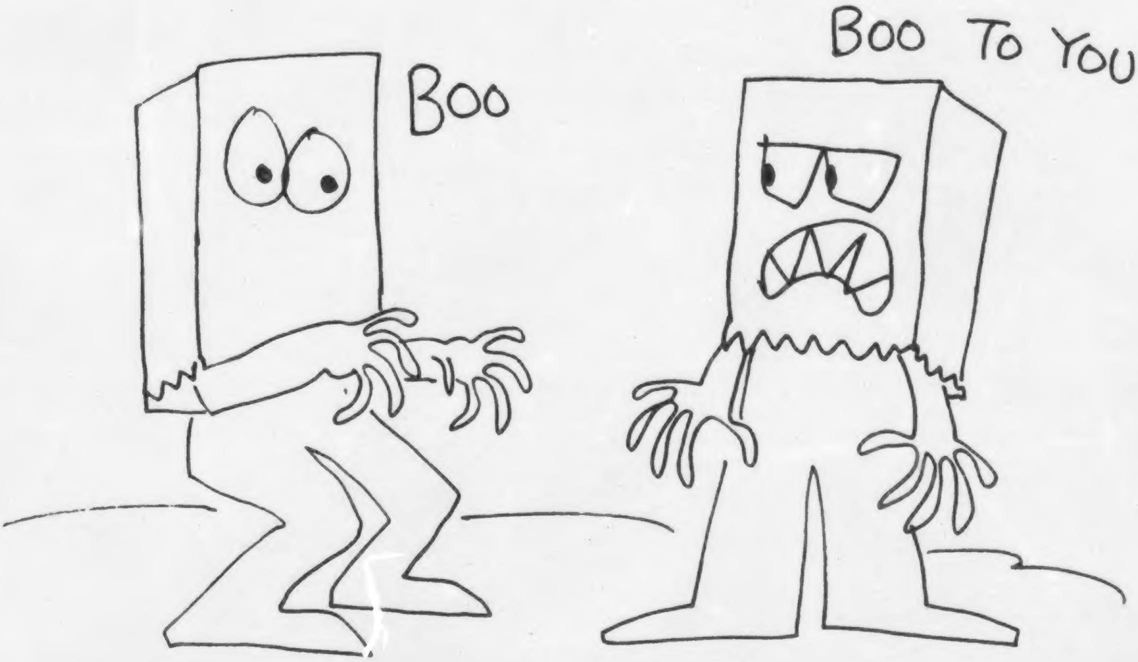
Paper Shopping Bags

A long time ago there weren't any shopping bags. People brought their own reusable containers with them to the stores to bring home their purchases. Then in 1906 the first paper shopping bags were made. Now paper bags are used by all the stores. Three big paper companies make hundreds of millions of paper bags every year.

There are lots of ways to recycle paper bags. You can use them again. Some stores will pay you 3¢ for every bag you return to use again. Other ways to recycle paper bags include - covering books, making a litter bag, making a mask. You can probably think of lots of other ways to use paper bags.

Here's how to make a mask.

1. Find a used bag big enough to comfortably go over your head.
2. Cut out the spaces where your eyes will be able to look out from.
3. Add hair, eyelashes, a nose, a mouth, ears, and whatever else you'd like.



FRUITful SEEDS

Many fruit seeds will grow easily in the classroom. Children can collect seeds from the kitchen at home or save them from their lunches at school. This is an inexpensive and easy way for children to see and understand the growth cycle of a plant.

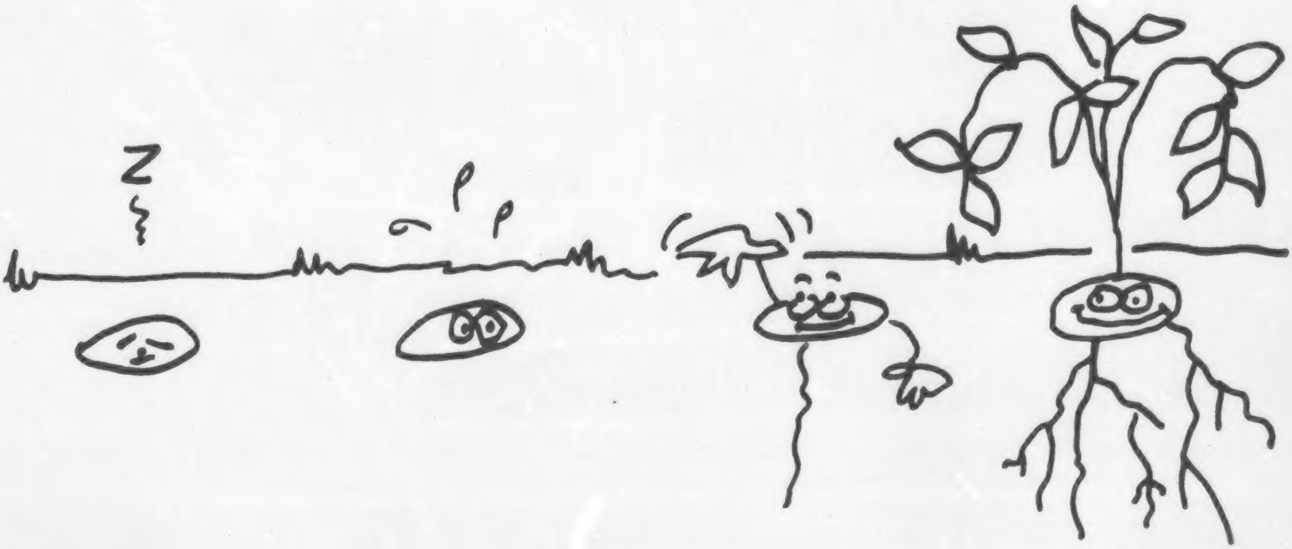
Citrus seeds, such as grapefruit, oranges, and lemons, should be washed and planted quickly to insure germination. Other softer seeds, like cantaloupe and honeydew melon, can be allowed to dry and stored in the refrigerator before planting.

You can grow almonds, walnuts and dates that have not been processed (roasted, salted, etc.) too. These will take a little longer to sprout but will make beautiful plants.

Seeds from stone fruits, such as cherries, peaches and apricots, need to be washed thoroughly before planting. They are the slowest to germinate.

Plant the seeds in a planting mix and allow for good drainage. Used paper cups with a hole punched in the bottom make good, inexpensive containers for most seeds. It's a good idea to plant several seeds in each container because some will not germinate. Water them well and cover with a thin layer of plastic wrap to help hold in the moisture. When the seeds begin to sprout, remove the plastic and move the plants to a place where there is plenty of light and sun.

(If you plant a variety of seeds, be sure to label your containers.



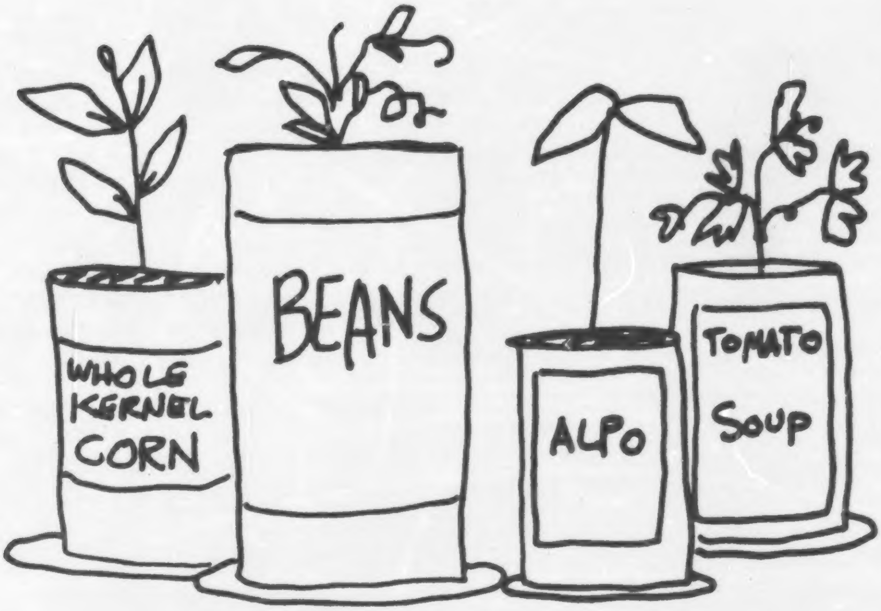
TIN CAN GARDENING

Here's a good way to recycle old tin cans and make a pretty garden for your kitchen at the same time.

Materials: Empty vegetable cans - Leave the labels on for color
Gravel or small pebbles for drainage
Hammer and nail
Planting mix
Seeds - tomatoes, beans, peas
Aluminum pie plate or saucer to catch drain water

How to do it:

1. Use hammer and nail to punch holes in the bottom of the can.
2. Put a layer of gravel or pebbles in the bottom of the can.
3. Add planter mix to about one inch from top of can.
4. Plant seeds, following directions on the package. Match the seeds to the can label, if you can.
5. Water. Keep the can on a light window sill and add water to keep the soil moist but not soggy.



Learn the song "It's a Small World" by Sherman and Sherman, Walt Disney, Inc.

Then sing these additional verses by Mary Hallesy and the 1976 LeConte Lodge Summer Staff.

1. There is just so much water and so much air
   And just so much land and food everywhere
   There's so much we must share, oh it's time we're aware
   It's a small world after all. (Chorus)

2. So many people using up so much so fast
   We cannot go on as we've done in the past
   It is time to confess, we have got to USE LESS
   It's a small world after all. (Chorus)

3. On this spaceship earth we are all a crew
   And we've got to learn what we must do
   It is time we're aware, we use more than our share
   It's a small world after all. (Chorus)

Reprinted by permission, Hidden Villa Inc., Drawer AH, Los Altos, California

Many people are working together to keep our environment clean and healthy for all living things. They will send you information that tells how you can help.

Remember, it takes energy and natural resources to make these materials, so only send for the things you really want to know more about.

Mr. Peanut's Guide to Ecology

This is a 22 page booklet that tells about our 'spaceship earth'. It has lots of ideas on how we can conserve our natural resources.

Write to: Standard Brands Educational Service
Box 2695
Grand Central Station
New York, N.Y. 10017

It's free.

Once There Lived a Wicked Dragon

This is the story of our growing pollution problem and what you can do about it.

Write to: Solid Waste Information Materials Control Section
U. S. Governmental Protection Agency
Cincinnati, Ohio 45268

Ask for booklet No. SW 105.1. It's free.

Energy Activities with Energy Ant

Here's a way to find out about the history of energy from dinosaur days to modern solar heated houses. The activities include dot to dots, crossword puzzles, and other fun things to do.

Write to: Federal Energy Administration
Office of Communications and Public Affairs
Washington, D.C. 20461

It's free.

Environmental Bingo Game

This is a new way to play Bingo and learn about environmental problems and solutions, too.

Write to: Conservation Committee
Garden Club of America
598 Madison Ave.
New York, N.Y. 10022

Send 20¢ for postage and handling charges.

Here are some other things to send for. These materials will give you information about energy and our natural resources.

The Story of Oil

This is a large poster that shows the development of oil.

Write to: Corporate Communications
Union Oil Company
Box 7600
Los Angeles, California 90051

It's free.

Solar Science Projects

This booklet includes directions for making seven solar projects, including a cooker, water heater and radio. It was written by D.S. Halacy, Jr.

Write to: Scholastic Book Services
50 W. 44th St.
New York, N.Y. 10036

Send 75¢

Earthbeats Newspaper No. 1 on Energy

This newspaper has many articles on alternative fuel sources and how they are being used in different parts of the world.

Write to: Sea Grant College Program
University of Wisconsin
1800 University Ave.
Madison, Wisconsin 53706

It's free.

You and Your Electric Company

Here is a 36 page booklet that has hundreds of facts about electricity and many ideas on how you can save electricity at home.

Write to: Edison Electric Institute
90 Park Ave.
New York, N.Y. 10016

It's free.

STUDENT BIBLIOGRAPHY

Here are some good books to read about conservation and pollution problems. Some may be in your school library. The others can be found in public libraries and in book stores.

1. The Giving Tree, Shel Silverstein, Harper and Row Co., N.Y.
   This is a wonderful story about the relationship between a tree and a man.
2. The Lorax, Dr. Seuss, Random House, N.Y.
   The Once-ler describes the results of the local pollution problem.
3. Sparrows Don't Drop Candy Wrappers, Margaret Gabel, Dodd, Mead and Co.
   Ways to help the environment are included in this book.
4. The Wump World, Bill Peet, Houghton Mifflin Co.
   An easy to read book about the dangers of pollution.
5. Let Them Live, Dorothy P. Lathrop, The Macmillan Co., N.Y.
   A book about the problems facing endangered animals.
6. The Only Earth We Have, Lawrence Pringle, The Macmillan Co., N.Y.
   Problems and solutions for taking care of the planet Earth.
7. About Saving Wildlife for Tomorrow, Solveig Paulson Russell, Melmont Publishers, Chicago, Ill.
   Includes suggestions for change that will help plants and animals.
8. Every Day is Earth Day, Illa Podendorf, Childrens Press, Chicago, Ill.
   Conservation ideas that you can do now.

Add the titles of other books about conservation.

9.

10.

11.

12.

13.

14.

NATURE ZOO
WILD FLOWERS
!

DIRECTIONS: Read the story then answer the question below.

Wild flowers are a pretty part of our countryside. They help to make our land more beautiful.

There are many places, especially near our cities, where wild flowers no longer grow. They have been picked and uprooted and stepped upon until they are gone. Many areas where they grow have been changed to make room for homes, shopping centers, and roads.

Lots of people are concerned that there aren't as many wild flowers growing anymore.

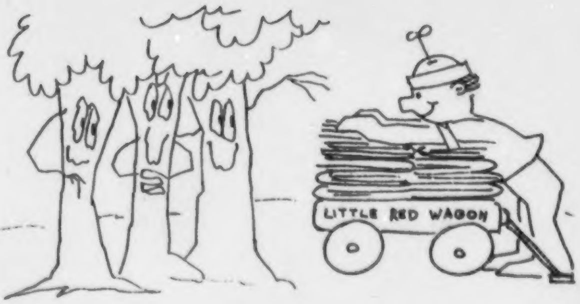
Can you think of some ways to save our wild flowers?

1. ____________________

2. ____________________

3. ____________________

310



Wood pulp is the main material used to make paper. If used paper is chopped up and remade into new paper, fewer trees will have to be cut. This is called recycling paper. Recycling is a great help in saving our forests. By saving your newspapers and bringing them to be recycled, you will help to save our trees.

DIRECTIONS:
Fill in the blank spaces with the correct words.

1. Recycling paper saves trees.
2. A large group of trees is called a forest.
3. When paper is chopped up to make paper, it is called pulp.
4. Using old paper to make new paper is called recycling.
5. You can save trees by recycling paper.

paper pulp forest trees recycling

311

Directions: Read the story then answer the question below.

RECYCLING

Recycling means the reuse of materials that we have thrown away after using them in their original form. We can recycle glass, aluminum, tin, paper and many other materials. Recycling can mean shredding old cans and cars and melting the pieces to make new metal for new cans and new cars. It can also mean crushing bottles into tiny glass bits and melting these bits to make new glass. Lots of materials can be recycled.

There are two main reasons for recycling materials. First, America is running out of raw materials to make new products. By using the same materials over and over again, we save our natural resources.

The second reason why we should recycle materials is to get rid of our growing piles of trash. When we throw used bottles and cans away, they become trash. Since there are more people in America today, there is also lots more trash. Getting rid of all the trash is one of our biggest problems. By recycling we reuse our trash instead of having to get rid of it. This solves part of our problem of what to do with the trash.

Why is it important to recycle materials?

1. To save our natural resources

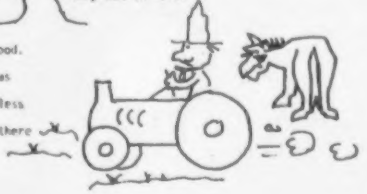
2. So we won't have as much trash

312

READ THE STORY

Once upon a time, there was plenty of room on Earth for all the plants, animals and people. They all shared their environments very nicely.

As years went by, there were more and more people. More people needed more homes. To build them, more trees were cut down. Wild animals also used the trees for homes. They had to move.



More people needed more food. To grow more food, more land was needed. The wild animals had less and less room and food. Soon there were fewer wild animals.

ANSWER THE QUESTIONS

1. People cut down trees to build homes
2. They needed more land to grow food
3. The wild animals had less and less room and food
4. There were fewer wild animals

313

All of the things we use every day come from some kind of natural resource. Natural resources are materials supplied to us by nature, such as coal, oil, water, rich soil, trees and other plants.

Look around your room. Do you know what natural materials were used to make paper, pencils and wooden furniture? Window glass and light bulbs are made from sand. Most metal things, such as scissors, pins and waste baskets are made from ores in the ground.

What are the plastic things made from?

Follow the directions to find out.

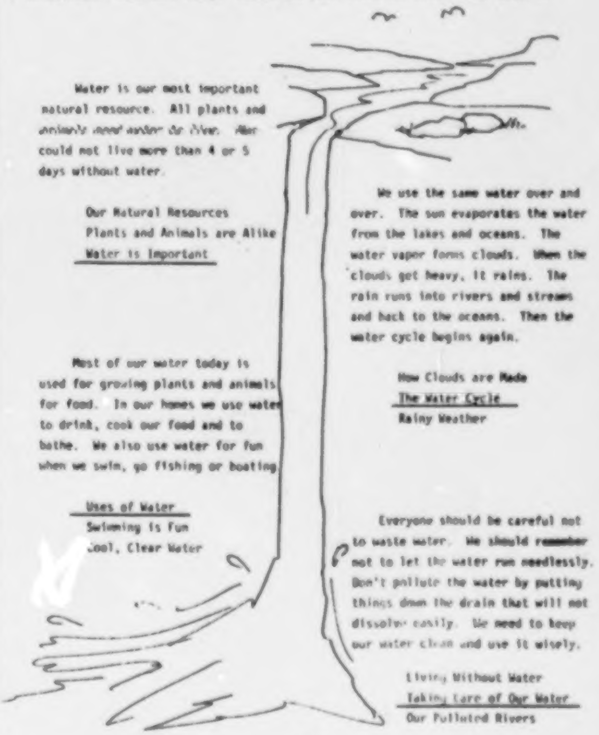
Draw a circle around every set of four numbers that are in order, such as 2, 3, 4, 5 or 6, 7, 8, 9. The numbers are always in a straight line and go up, down and across.

6	7	3	8	6	8	1	2	5	1	6	3	2	8
9	2	3	4	5	3	5	6	8	9	1	8	4	6
1	3	6	2	6	7	9	7	2	4	2	7	7	1
8	4	1	3	7	1	3	8	2	6	3	5	2	3
2	5	6	7	8	5	1	9	4	7	4	5	6	7
7	2	9	4	3	6	4	3	5	1	8	6	9	6

Write the correct answers.

1. Paper is made from (plastic, wood) wood.
2. Oil is used to make (plastic, trees) plastic.
3. Most glass is made from (oil, sand) sand.
4. Natural resources are materials supplied by (man, nature) nature.

DIRECTIONS: Read each story. Choose the best title and draw a line under it.



Water is our most important natural resource. All plants and animals need water to live. Man could not live more than 4 or 5 days without water.

Our Natural Resources
Plants and Animals are Alike
Water is Important

Most of our water today is used for growing plants and animals for food. In our homes we use water to drink, cook our food and to bathe. We also use water for fun when we swim, go fishing or boating.

Uses of Water
Swimming is Fun
Cool, Clear Water

We use the same water over and over. The sun evaporates the water from the lakes and oceans. The water vapor forms clouds. When the clouds get heavy, it rains. The rain runs into rivers and streams and back to the oceans. Then the water cycle begins again.

How Clouds are Made
The Water Cycle
Rainy Weather

Everyone should be careful not to waste water. We should remember not to let the water run needlessly. Don't pollute the water by putting things down the drain that will not dissolve easily. We need to keep our water clean and use it wisely.

Living Without Water
Taking Care of Our Water
Our Polluted Rivers

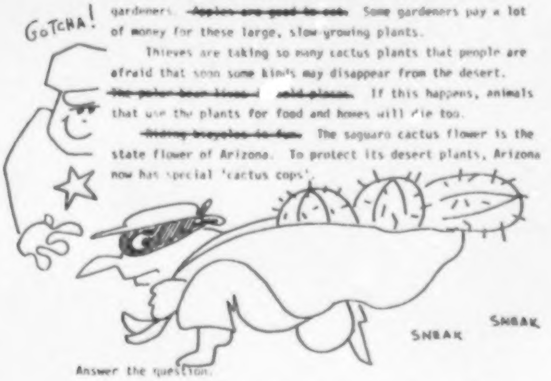
DIRECTIONS: Read the story. Draw a line through the sentences that do not belong in the story.

Cactus Cops

Police in Arizona often chase a different kind of thief. They look for people who steal cactus plants and sell them to gardeners. ~~Apples are good to eat.~~ Some gardeners pay a lot of money for these large, slow-growing plants.

Thieves are taking so many cactus plants that people are afraid that soon some kinds may disappear from the desert. ~~The polar bear lives in cold places.~~ If this happens, animals that use the plants for food and homes will die too.

~~Riding bicycles is fun.~~ The saguaro cactus flower is the state flower of Arizona. To protect its desert plants, Arizona now has special 'cactus cops'.



Answer the question.

What will happen if the cactus plants disappear from the desert?

Animals that use the plants for food and homes will die.

WHOOP!
whoop
WHOOP!

The Whooping Crane

The whooping crane is an endangered species. Thirty years ago there were only 21 whooping cranes alive in the world. Today the number has grown to 99. Some people who cared about the whooping crane got laws passed to protect the cranes' winter home in Texas. They also began taking some eggs from the wild cranes and raising the baby chicks.

Whooping cranes usually lay two eggs at a time, but only one chick grows up. The babies fight, and the stronger chick steals the food from the weaker one. To stop this, scientists keep baby cranes in pens with baby turkeys. During fights, the turkeys can outrun the cranes and they don't get hurt. Sometimes scientists put whooping crane eggs into the nests of other birds. These different birds will raise the baby whooping cranes as their own.

People who care may be able to save the whooping crane from becoming extinct.

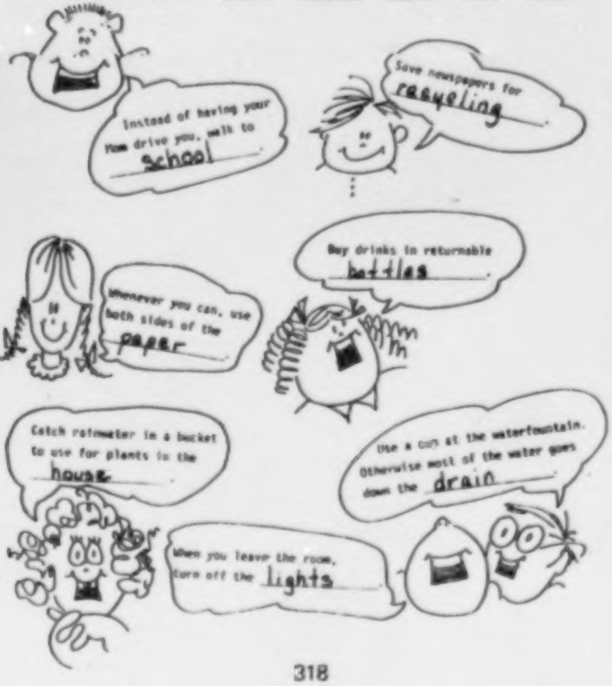
Write "yes" or "no" after each sentence.

1. The whooping crane is an endangered species. yes
2. The cranes' winter home is in California. no
3. Sometimes whooping crane chicks are raised with turkeys. yes
4. Whooping cranes got laws passed to protect their winter homes. no
5. There are more whooping cranes alive today than 30 years ago. yes

Answers: 314, 315, 316, 317

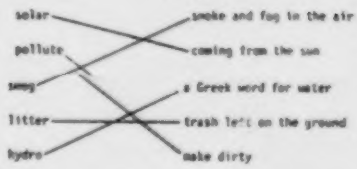
DIRECTIONS: These students have thought of ideas on how to save energy and stop waste. The last word of each idea is missing. Use the following words to complete the sentences.

drain paper bottles recycling lights house school


Instead of having your Mom drive you, walk to school.
Save newspapers for recycling.
Buy drinks in returnable bottles.
Whenever you can, use both sides of the paper.
Catch rainwater in a bucket to use for plants in the house.
Use a cup at the waterfountain. Otherwise most of the water goes down the drain.
When you leave the room, turn off the lights.

DIRECTIONS:

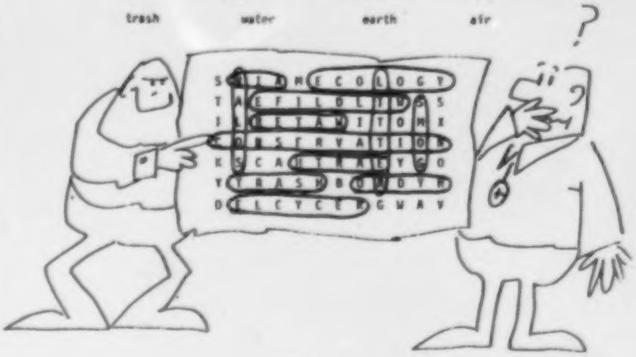
Draw a line from the word to its meaning.



solar	smoke and fog in the air
pollute	coming from the sun
smog	a Greek word for water
litter	trash left on the ground
hydro	make dirty

Find the ecology words in this Word Find. The words may be spelled forward, backward, up or down.

ecology	wildlife	smog	hydro
solar	recycle	conservation	litter
trash	water	earth	air



S R I A M E C O L O G Y
T A E F I L D L I W S S
I L R E T A W I T O M I
C O N S E R V A T I O N
K S C A H T R A E Y G O
Y T R A S H B O R D Y H
D E L C Y C E R G W A V

Here is a page from TV Guild. Use the page to answer the questions at the bottom of this paper.

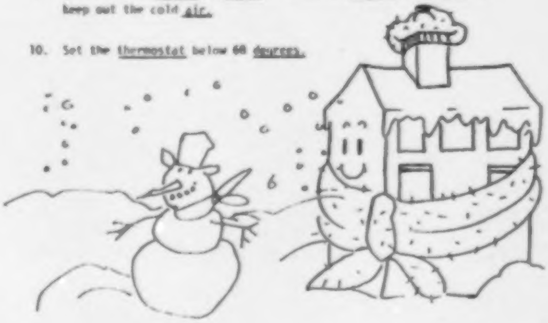
TV GUILD MAY 11, 1979
1:30 PM to 3:00 PM

④ ONCE UPON A CARROT - Cartoon
⑤ GROWING UP GREEN
2:00 ③ MOVIE - Science Fiction
"Godzilla meets Mr. Greenjeans" (2hrs.)
⑧ NEWS
⑤ OUR EARTH
How to make money recycling bottlecaps.
⑦ SESAME STREET - Children
2:30 ④ CAPTAIN HYDRO - Cartoon
⑤ M*A*S*H
When the camp's electricity goes out, Radar builds his own windmill.
⑦ NATURE CRAFTS
3:00 ④ TODAYS GARDEN
Mr. Flowers tells how to grow pumpkins in your family room.
⑤ ONE ROOT TO GROW - Serial

1. What time is the news shown? 2:00 P.M.
2. Write the names of the two cartoons.
Once Upon a Carrot
Captain Hydro
3. What is the name of the program that tells you how to make money by recycling bottlecaps?
Our Earth
4. What program is on channel ⑦ at 2:30? Nature Crafts.

DIRECTIONS: Draw a line under the common nouns in each sentence. **Remember**, a common noun is the name of a person, place or thing.

1. We can keep our homes warm in the winter.
2. We can save energy too.
3. Here are some ideas.
4. Put a rolled up rug or towel at the bottom of the door to keep out the cold wind.
5. Close the vent in the fireplace when it is not in use.
6. Don't leave the door open while you talk to your friends.
7. Wear socks or "footsies" to bed.
8. Put a sweater on if you get chilly.
9. Pull down the shades at night or close the drapes on windows to keep out the cold air.
10. Set the thermostat below 68 degrees.



Answers: 318, 319, 320, 321

DIRECTIONS The names of these endangered animals are hidden in the sentences below. Find the words and draw a circle around them.

whale manatee yak condor
panda gorilla

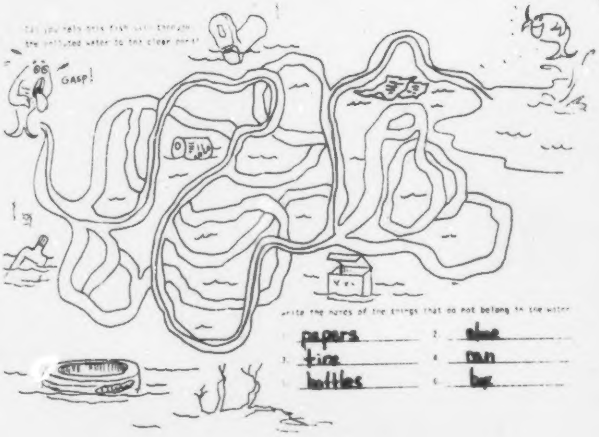
1. Don't forget to wash the pan, Dad!
2. A man ate eleven hamburgers for lunch yesterday.
3. Is Igor ill again?
4. I think the party is on the second or third of April.
5. Did you know Haley's comet is only seen once every 75 years?
6. Is he really a king?

Write the names of these endangered animals in alphabetical order.

polar bear timber wolf brown pelican
tiger cheetah bald eagle

1. bald eagle
2. brown pelican
3. cheetah
4. polar bear
5. tiger
6. timber wolf

Can you help this fish swim through the polluted water to the clear pond?



Write the names of the things that do not belong in the water

1. papers
2. shoe
3. tire
4. can
5. bottles
6. box

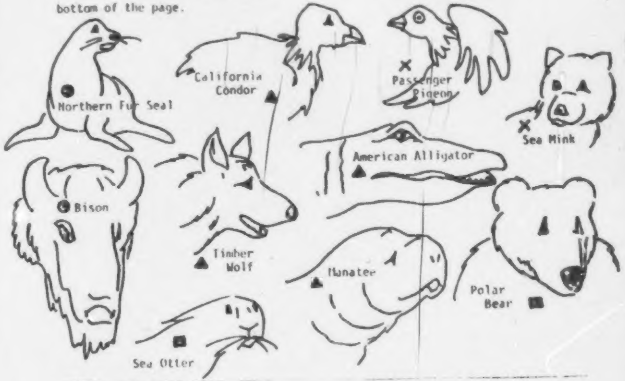
SENTENCES ?

DIRECTIONS:
Write Yes in front of each group of words that is a sentence.
Write No in front of each group of words that is not a sentence.

Yes 1. Plastic is made from oil.
No 2. The biggest cause of air pollution.
No 3. Used mostly in the country.
Yes 4. Petroleum is another word for oil.
Yes 5. Wood is sometimes used to make paper.
Yes 6. All animals need plants.
No 7. The most important source of energy.
Yes 8. Burning plastic cups and plates pollutes the air.
Yes 9. Sewage pollutes rivers.
No 10. An animal or plant that there are not any more of.

PROTECTING OUR WILDLIFE

The United States government now lists 174 kinds of endangered animals. Here are a few that are being carefully watched and some that it is too late to help. Use the symbols to put the animals in the correct lists at the bottom of the page.



● An animal that was in trouble but is now out of danger.
1. Northern Fur Seal 2. Bison

■ Threatened
1. Polar Bear 2. Sea Otter

▲ ENDANGERED
1. American Alligator 2. Manatee
3. California Condor 4. Timber Wolf

✕ EXTINCT
1. Passenger Pigeon 2. Sea Mink

Directions: Complete the sentences by writing a word in the blank spaces. Write the word on the numbered spaces that follow each sentence. Use these letters as a code to find the answer to the question.

What is the most important reason to recycle things?

Bottles and jars made of GLASS can be crushed to make new ones.
G L A S S
9 8 5 4 4

Aluminum cans can be melted down to make new ones, too.
C A N S
6 5 3 4

Recycling paper saves our trees.
T R E E S
2 7 1 1 4

Cans made of tin can also be recycled.
T I N
2 10 3

Many things can be used over again.
U S E D
11 4 1 12

Recycling can save money.
S A V E
4 5 15 1

Is there a recycling center in your neighborhood?
Y O U R
14 13 11 7

R E C Y C L I N G
7 1 6 14 6 8 10 3 9

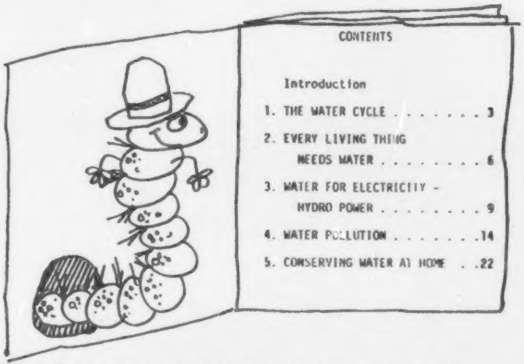
S A V E S
4 5 15 1 4

O U R
13 11 7

N A T U R A L
3 5 2 11 7 5 8

R E S O U R C E S.
7 1 4 13 11 7 6 1 4

DIRECTIONS: Use the Table of Contents to answer the questions.



CONTENTS

Introduction

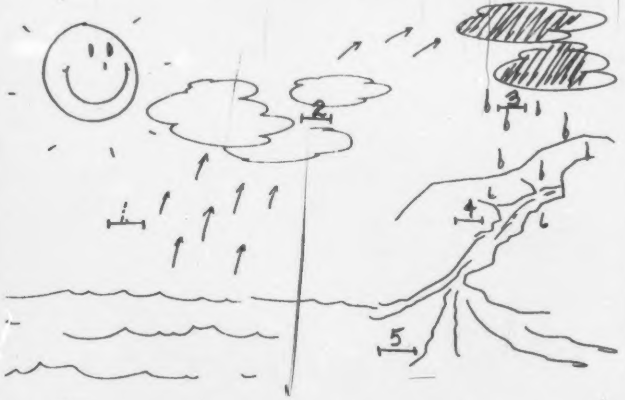
1. THE WATER CYCLE 3
2. EVERY LIVING THING NEEDS WATER 6
3. WATER FOR ELECTRICITY - HYDRO POWER 9
4. WATER POLLUTION 14
5. CONSERVING WATER AT HOME . .22

1. To find out that we cannot live without water, you should look on page 6.
2. The chapter about the water cycle begins on page 3.
3. Ways of saving water begin on page 22.
4. The problems of dirty water start on page 14.
5. How we use water to light our homes will begin on page 9.
6. Fixing faucets that drip and taking short showers will begin on page 22.

THE WATER CYCLE

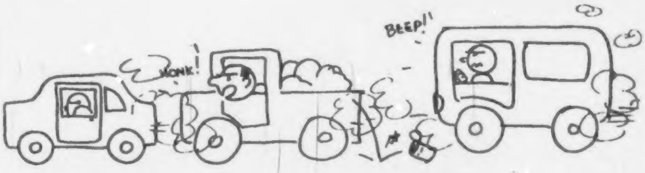
A cycle is a circle of events that happen over and over again in the same order. Here is how nature's water cycle works.

Solar energy (heat from the sun) evaporates the waters from oceans and lakes. This water becomes water vapor as it rises in the air. The water vapor gathers together to become clouds. As the clouds get bigger and heavier, they cool and turn into rain. When it rains, the water runs into rivers and streams. These rivers and streams flow back to the lakes and oceans and the cycle begins all over again.



Put these numbers on the part of the picture that shows what is happening.

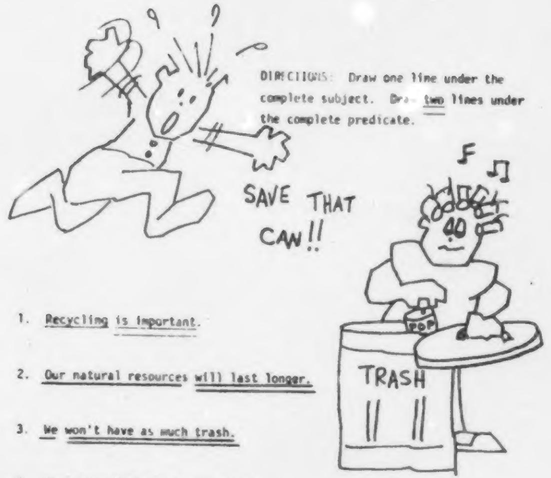
1. The sun's energy evaporates the water.
2. The water vapor gathers into clouds.
3. The clouds cool and rain begins.
4. Rain runs into rivers and streams.
5. The rivers and streams flow back to the ocean and lakes.



Here are some things that cause pollution. Unscramble the words and write the letters on the matching numbered spaces below. If you are correct, you will find out how we should keep our environment.

1. R S A C — $_1$C A R S
2. T E T R I L — $_2$L I T T E R
3. K S O E M — S M O K E_3
4. R A I L E N S P A — A I R P L A_4 N E S
5. O I N E S — N_5 O I S E

This is how we should keep our environment. C L E A N
1. 2. 3. 4. 5.



DIRECTIONS: Draw one line under the complete subject. Draw two lines under the complete predicate.

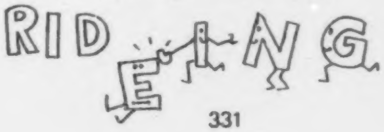
1. Recycling is important.
2. Our natural resources will last longer.
3. We won't have as much trash.
4. Many materials can be recycled.
5. Glass, tin, aluminum and paper can be used to make new things.
6. All of us can save newspapers for recycling.
7. Some paper companies will buy old newspapers.
8. People can save energy and money too.

DIRECTIONS

Read the sentences. Add ing to the underlined words and fill in the blanks. Don't forget to drop the silent e.

Example: come coming

1. Since cars cause air pollution, car pooling is better than drive driving alone.
2. Letting the faucets drip is waste wasting water.
3. Throwing trash out your car window is cause causing pollution of the earth.
4. Use Using paper cups is more wasteful than drinking from cups that can be washed and used many times.
5. Smoke Smoking chimneys from factories pollute the air.
6. Smog in the air is damage damaging to plants and animals.
7. Dumping sewage into lakes and rivers is make making them polluted.
8. Take Taking old newspapers to a recycling center helps save trees.
9. Oil spilled in the ocean is pollute polluting the water and killing birds and fish.
10. Using too much paper and plastic in package packaging the things we buy causes pollution of the earth.



Mrs. Peterson's class is having a spelling bee. Cross out the incorrect words to find out which team spelled more words correctly.

Betty's Team	Frank's Team
1. clean	1. ~~clene~~
2. earth	2. ~~earthe~~
3 ~~dirtee~~	3. dirty
4. pollution	4. ~~[illegible]~~
5. ~~litere~~	5. litter
6. smog	6. ~~[illegible]~~
7. ~~conservashun~~	7. conservation
8. ~~saveing~~	8. saving
9. waste	9. ~~wast~~
10. recycle	10. ~~recycel~~

How many words did Betty's team spell correctly? 6

How many words did Frank's team spell correctly? 4

Which team won the spelling bee? Betty's

CAT
RAT
SPELLING BEE

DIRECTIONS: Mark the circle in front of the correct word in each sentence.

1. ○ we ● We should not waste water.
2. Solar energy comes from the ● sun. ○ Sun.
3. Picking up litter will help keep ○ america ● America clean.
4. The "don't pollute" owl is named ● Woodsy. ○ woodsy.
5. Hydro power comes from ● water. ○ Water.
6. We are trying to keep ○ california ● California green.
7. Littering is one way we pollute the ● earth. ○ Earth.
8. The ● dinosaur ○ Dinosaur is an extinct animal.
9. A volcano in our state is ● Mt. Lassen. ○ mt. lassen.
10. Smog is a kind of ● air ○ Air pollution.
11. Not wasting paper in ● school ○ School helps to save our trees.
12. ○ i ● I am not a litterbug.

373

Answers: 330, 331, 332, 333

PARTS OF A LETTER

Letters usually have five parts: the heading, the greeting, the body or main part of the letter, the closing, and the signature.

Correct the "body" of the letter below by putting periods at the ends of sentences and beginning the new sentences with capital letters.

350 Sunshine Way
San Jose, California
March 13, 1979

Dear Sam,

I really like my new house. We are almost unpacked. My dad and I are putting solar panels on the roof. The sun heats up the water in the panels and we get hot water in the house. They call it solar heating because the heat comes from the sun.

It is one way of saving energy and money, too. I'll show you how it works when you come to visit. Make it soon.

Your friend,

Jack

Draw a line under the greeting.

Put a box around the heading.

Make a circle around the closing.

Put an X on the signature.

DIRECTIONS: Put a period (.) or question mark (?) at the end of each sentence.

1. The most important liquid is water .
2. We use water for drinking and for raising food .
3. What do firemen use water for ?
4. In June, we swim in pools, lakes and oceans .
5. When will Ann water her plant ?
6. I turn off the water when I'm finished brushing my teeth .
7. Why did Jack and Jill go up the hill ?
8. Who is Captain Hydro ?
9. The Pacific and Atlantic Oceans are large bodies of water .
10. It usually rains in December, January, and February .
11. Water is our most important natural resource .
12. How long could man live without water ?
13. Water flowing downhill turns waterwheels .
14. How can I make Kool-Aid without water ?
15. All plants and animals need water to live .

DIRECTIONS: Find the contraction in each sentence and draw a line under it. Write the contraction and its meaning on the blanks.

1. I'm going to save water.
I'm I am
2. When I brush my teeth, I won't leave the water running.
won't will not
3. I'll ask my Mom or Dad to fix the leaky faucets.
I'll I will
4. We'll all take short showers instead of baths.
We'll we will
5. Putting things down the toilet isn't a good idea.
isn't is not
6. Everyone knows we shouldn't waste water.
shouldn't should not
7. I don't think it will be very hard to do.
don't do not

DIRECTIONS:

Read the story. Write the underlined words in the correct column below. Divide the two syllable words.

USING THE WIND AND WATER FOR ENERGY

Long ago people invented simple machines to help them do their work. Some of these early machines got their power (energy) from the wind or from running water. Windmills and waterwheels were used to grind grain and to pump water.

Using the wind and water to operate their machines made work easier for people. It didn't cost much either because the wind and the water were free. This was better than using muscle power.

But the wind didn't always blow and then people couldn't use its energy. Also some people did not live near fast moving water, so they couldn't use that energy either.

People began to find new ways to get energy. They began cutting wood and using fossil fuels to burn. These fuels are still used today to provide energy for our machines.

One syllable words	Two syllable words
1. help	1. run/ning
2. work	2. wind/mills
3. pump	3. better
4. blow	4. cutting
5. wind	5. fos/sil

Answers: 334, 335, 336, 337

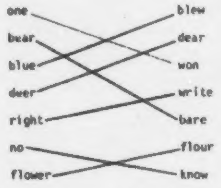
DIRECTIONS: Use these words to make compound words in the sentences below.

shine papers ground times
shore bugs one wood way life

1. News *papers* can be recycled to save our trees.
2. Please do not litter the play *ground*.
3. Both plants and animals need sun *shine*.
4. The teacher asked every *one* to save soup labels.
5. People who drop trash on the streets are litter *bugs*.
6. Red *wood* trees usually grow in parks close to oceans.
7. Too many cars on the high *ways* can cause air pollution.
8. Forest rangers help to protect our wild *life*.
9. Dirty air some *times* causes people to get sick.
10. Cans and bottles left on the beach litter our sea *shore*.

HOMONYMS are words that sound alike but are spelled differently and have different meanings.

Connect the words that sound alike.



Choose the correct homonym to complete these sentences.

1. The wind *blew* the dirty air away.
   blue blew
2. An animal that likes to eat plants is a *deer*.
   deer dear
3. Not wasting water is the *right* thing to do.
   write right
4. The panda *bear* is an endangered animal.
   bare bear
5. We *know* that cars cause air pollution.
   know no
6. The *sun* warms our earth.
   son sun

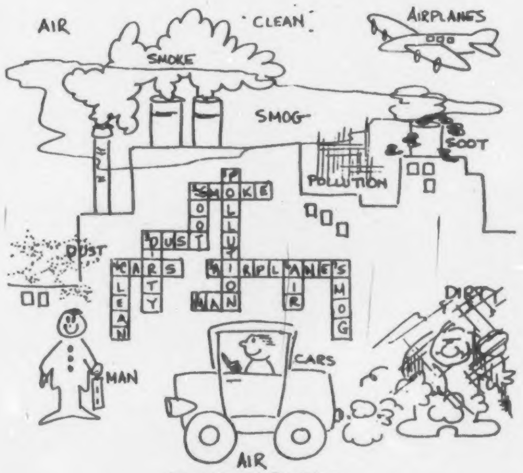
SYNONYMS - Words that mean the same thing or almost the same thing.

DIRECTIONS: Use the following words to fill the blanks in the sentences below. Write the word in the blank that means almost the same thing as the word in (parentheses).

collect build as instead save
soil clean shut pile litter

Here are some ways you can help to (conserve) *save* our natural resources.

1. Turn off the faucet (while) *as* you brush your teeth.
2. When you can, take short showers (rather than) *instead* of baths.
3. Do not burn papers or leaves. Instead make a compost (heap) *pile* that will help the (dirt) *soil*.
4. (Make) *Build* a bird house. Birds are the natural enemies of insects.
5. Plant a tree. They help to (wash) *clean* the air.
6. Keep a (trash) *litter* bag in your car, and use it!
7. When you leave a room, (close) *turn* off lights, radio and TV.
8. Save old newspapers for groups that (gather) *collect* them or recycle the newspapers yourself.



AIR POLLUTION PUZZLE

Across

2. Smog is fog and ______.
3. Powdered dirt is ______.
4. Exhaust from ______ adds dirt to the air.
5. Exhaust from ______ also adds dirt to the air.
8. Only ______ can help clean up the air.

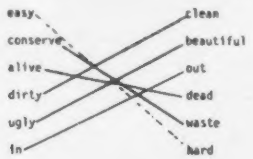
Down

1. Dirty air is called ______.
2. Ashes are sometimes called ______.
3. Polluted air is ______.
4. Air without pollution is ______.
6. We need ______ to breathe.
7. Smoke mixed with fog is ______.

Answers: 338, 339, 340, 341

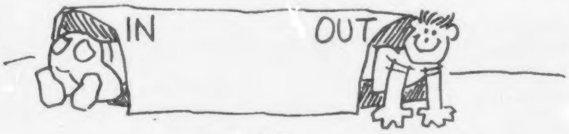
ANTONYMS - Words with opposite meanings.

DIRECTIONS: Draw a line between the words that are opposites.



Use some of the words to fill in the blanks of the sentences.

1. Cars do not make our air clean. They make it dirty.
2. When animals are extinct, there are none left alive. They are all dead.
3. A beautiful park will look ugly after a forest fire.
4. We need to conserve our natural resources. We should not waste them.
5. When people move into the animals habitats, the animals move out.
6. It is not hard to recycle things. There are lots of easy ways to do it.



ENDANGERED ANIMALS

Here are some animals that there are only a few of left on the earth. They are called "endangered" because soon there may not be any more and they will become "extinct".

If people care enough, they may be able to save some of these animals who are in danger.

Find these endangered animals in the puzzle.

WHALE TIGER CHEETAH MANATEE
RHINOCEROS YAK POLAR BEAR
PANDA TIMBER WOLF GORILLA
OTTER FERRET VICUNA

A N I M A L S H O P
S R T A D N A P D I
E H O C P T X G A G
T I M B E R W O L F
I N B E M O C R H E
G O H E T H E I W R
E C X T W H A L E R
R E E A T M F L K E
T R E N R W Y A K T
P O L A R B E A R A
R S E M A N U C I V

DIRECTIONS:

Write the following words in alphabetical (ABC) order.

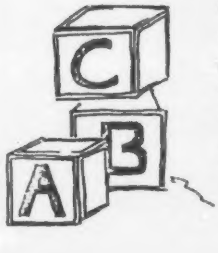
pollution	solar	smog	recycle
extinct	conservation	important	endangered

1. conservation
2. endangered
3. extinct
4. important
5. pollution
6. recycle
7. smog
8. solar

Use the first letter of the words on lines 8, 4 and 6 to find the answer.

"What do you call a 2000 pound gorilla?" S I R

DIRECTIONS: Each alphabet has a letter missing. Write the missing letters on the spaces to find the answers to the two questions.



1. A B C D E F G H I J K L M N O P Q R S U V W X Y Z
2. A B C D E F G I J K L M N O P Q R S T U V W X Y Z
3. A B C D F G H I J K L M N O P Q R S T U V W X Y Z
4. A B C D E F G H I J K L M N O P Q R T U V W X Y Z
5. A B C D E F G H I J K L M N O P Q R S T V W X Y Z
6. A B C D E F G H I J K L M O P Q R S T U V W X Y Z

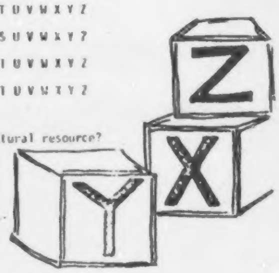
Question: What is our most important source of energy?

Answer: T H E S U N
1 2 3 4 5 6

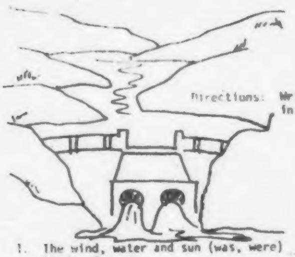
1. A B C D E F G H I J K L M N O P Q R S T U V X Y Z
2. B C D E F G H I J K L M N O P Q R S T U V W X Y Z
3. A B C D E F G H I J K L M N O P Q R S U V W X Y Z
4. A B C D F G H I J K L M N O P Q R S T U V W X Y Z
5. A B C D E F G H I J K L M N O P Q S T U V W X Y Z

Question: What is our most important natural resource?

Answer: W A T E R
1 2 3 4 5

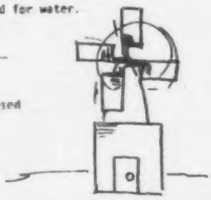


Answers: 342, 343, 344, 345



Directions: Write the correct word in the space in each sentence.

1. The wind, water and sun (was, were) were the first kinds of energy.
2. They (is, are) are the three kinds of energy that cannot be used up.
3. A sailboat (is, are) is moved by the wind.
4. Windmills (was, were) were used to pump water on most farms.
5. Sun power (is, are) is called solar power.
6. Clothes hanging on a clothesline (is, are) are dried by the heat from the sun.
7. Some swimming pools (is, are) are heated by solar power.
8. Hydro (is, are) is another word for water.
9. Many dams (was, were) were built to get energy from falling water.
10. Moving water (is, are) is used to turn wheels to make electricity.



346

Directions : Read the sentences. Circle the correct word.

1. You have ([✓ heard,] hear) that paper comes from trees.
2. Did you know that paper can be (make, [✓ made]) from old used paper?
3. It is ([✓ called,] calling) recycled paper.
4. Cardboard (come, [✓ comes]) from old paper with the ink left in.
5. Paper companies are (cut, [✓ cutting]) down more and more trees to make pap
6. New trees are not ([✓ growing,] growed) fast enough to replace trees that a
7. Some companies are (chop, [✓ chopping]) down trees in our national forests.
8. If we recycle our paper, we can help to ([✓ save,] saves) some of our tree
9. You can collect old newspapers and ([✓ take,] took) them to a recycling ce
10. You can (recycling, [✓ recycle]) paper at home and at school.
11. ([✓ Use,] Used) the back of old paper for scratch paper.
12. Can you (thinks, [✓ think]) of other ways to recycle paper?

347

RHYMING WORDS

DIRECTIONS: Circle the words in each row that rhyme with the first word.

sun - [✓ fun] ran [✓ one] [✓ won]
light - [✓ might] [✓ bright] [✓ kite] tiger
smoke - [✓ choke] [✓ joke] small [✓ poke]
tree - east [✓ knee] [✓ see] [✓ we]
grow - [✓ show] [✓ know] look [✓ go]

Add a word to finish these rhymes.

Nancy planted a flower seed.
But all that grew was a great big weed.

A forest fire can kill many trees.
So be very careful with matches, please.

Lightning can start a forest fire, too.
Not a nice thing for Mother Nature to do.

With all the pollution up in the sky,
It's getting harder for all birds to fly.

The bright blue lake is changing today.
Trash and sewage are turning it gray.

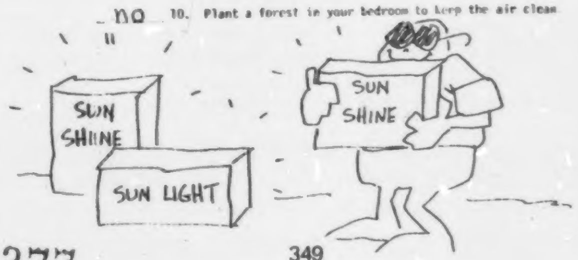
348

Many people are trying to clean up our environment. Here is a list of ways to help.

Write Yes in front of the ways that will help.

Write No in front of the ways that are foolish and will not help.

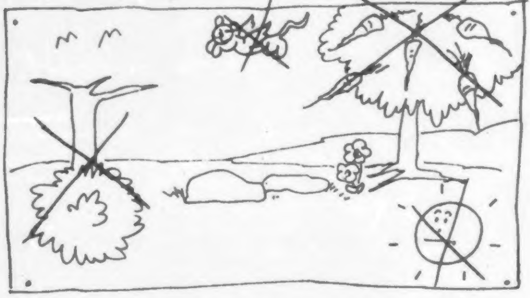
yes 1. Turn off the water while you are brushing your teeth.
no 2. Paint everything white so it will look cleaner.
yes 3. Whenever you can, use things over again.
yes 4. Pick up litter.
no 5. Save the sunlight in boxes in your garage.
yes 6. Write on both sides of the paper.
yes 7. On short trips, walk or ride your bicycle.
no 8. Use your vacuum cleaner to get rid of the dirt in your backyard.
yes 9. Take bottles, cans, and newspapers to recycling centers.
no 10. Plant a forest in your bedroom to keep the air clean



349

Answers: 346, 347, 348, 349

Put an X on the things in the picture that are wrong.



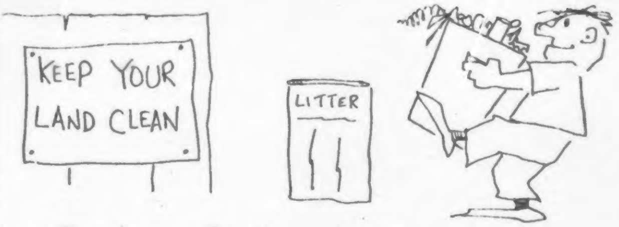
Use the graph to read the sentence:

	1	2	3	4	5	6	7
A	a	b	c	d	e	f	g
B	h	i	j	k	l	m	n
C	o	p	q	r	s	t	u
D	v	w	x	y	z		

it's not nice to
2B 6C 5C 7B 1C 6C 7B 2B 3A 5A 6C 1C

fool mother nature.
6A 1C 1C 5B 6B 1C 6C 1B 5A 4C 7B 1A 6C 7C 4C 5A

350



Directions: Do the problems.
Use your answers to read the message

T $\begin{array}{r}6\\ \times 4\\ \hline 24\end{array}$	E $\begin{array}{r}7\\ \times 3\\ \hline 21\end{array}$	X $\begin{array}{r}5\\ \times 6\\ \hline 30\end{array}$	N $\begin{array}{r}7\\ \times 4\\ \hline 28\end{array}$
L $\begin{array}{r}9\\ \times 6\\ \hline 54\end{array}$	V $\begin{array}{r}7\\ \times 7\\ \hline 49\end{array}$	A $\begin{array}{r}3\\ \times 9\\ \hline 27\end{array}$	I $\begin{array}{r}2\\ \times 8\\ \hline 16\end{array}$
O $\begin{array}{r}5\\ \times 4\\ \hline 20\end{array}$	B $\begin{array}{r}6\\ \times 6\\ \hline 36\end{array}$	G $\begin{array}{r}4\\ \times 3\\ \hline 12\end{array}$	R $\begin{array}{r}8\\ \times 5\\ \hline 40\end{array}$

BE AN EAGER BEAVER,
36 21 27 28 21 27 12 21 40 36 21 27 49 21 40

NOT A LITTER LEAVER!
28 20 24 27 54 16 24 24 21 40 54 21 27 49 21 40

351

DIRECTIONS: Read the problems. Write the numerals on the blank spaces.

1. Carole and Judy are saving cans for recycling. They each have 8 cans saved so far. How many do they have together?

   8 x 2 = 16 cans

2. Tom, Dick and Harry are saving cans too. They have each saved 9 cans. How many do they have all together?

   9 x 3 = 27 cans

3. Six girls in the third grade each saved 7 stacks of newspapers. How many stacks of newspapers do they have in all?

   6 x 7 = 42 stacks of newspapers

4. Bob and Betty saved 4 boxes of glass bottles. Each box had 8 bottles in it. How many bottles did they have all together?

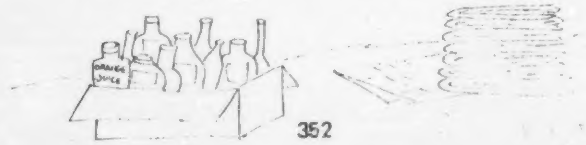
   4 x 8 = 32 bottles

5. Jim and Mary were saving bottles too. They had 5 boxes of bottles. Each of their boxes had 7 bottles in it. How many bottles did Jim and Mary have?

   5 x 7 = 35 bottles

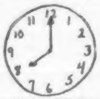
6. If Bob and Betty put their bottles together with Mary and Jim's, how many will they have in all?

$$\begin{array}{r}32\\ 35\\ \hline 67\end{array}$$

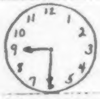


352

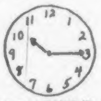
Directions:
This is Bill's conservation schedule. Draw the hands on the clocks.



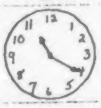
8 o'clock - Collect newspapers to recycle



9:30 - Collect tin cans and bottles to recycle



10:15 - Go to the recycling center



11:20 - Pick up litter in neighborhood

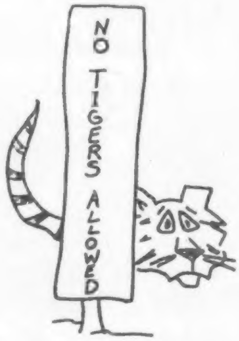
Write the time

1. When did Bill pick up litter? 11:20
2. At what time did Bill get the newspapers? 8:00
3. Bill went to the recycling center at 10:15 .
4. When did Bill start to collect cans and bottles? 9:30

353

Answers: 350, 351, 352, 353

Many plants and animals cannot live where there are lots of people. As people build more and more houses and roads, the animals must move. Often, when animals are forced to leave their natural habitats, they die.



DIRECTIONS: Use the sign to fill in the blanks.

1. The fourth letter of the second word E
2. The first letter of the first word N
3. The last letter of the last word D
4. The first letter of the third word A
5. The same as number 2 N
6. The third letter in the second word G
7. The sixth letter in the third word E
8. The fifth letter in the second word R
9. The letter before the fifth letter in the second word E
10. The fifteenth letter in the phrase D

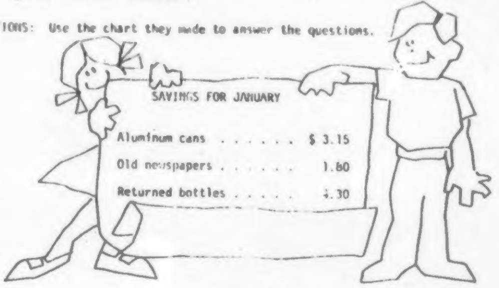
Use the letters in the blanks to complete the sentence.

When there are very few of a kind of plant or animal left alive, we say they are E N D A N G E R E D.

Recycling saves our natural resources, energy, and helps to stop waste.

The third grade class at John Muir School began to recycle things to buy something new for their classroom.

DIRECTIONS: Use the chart they made to answer the questions.

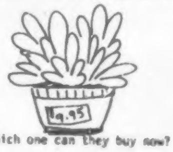


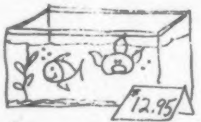
SAVINGS FOR JANUARY

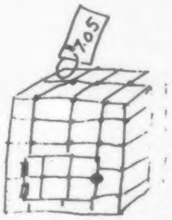
Aluminum cans	$ 3.15
Old newspapers	1.60
Returned bottles	4.30

How much money did they save in January? $9.25

Here are three things the class wants to buy?







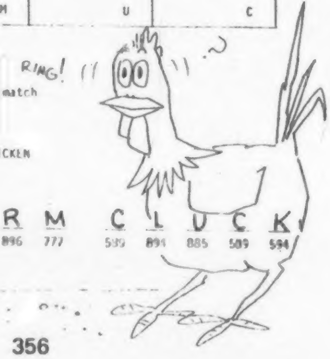
Which one can they buy now? Pet cage

How much money will they have left? $2.20

People use animals for many different things. We get food and clothes from animals. They can help us do work, provide transportation, and keep us company by being our pets.

DIRECTIONS: Do the addition problems to answer the silly riddle below.

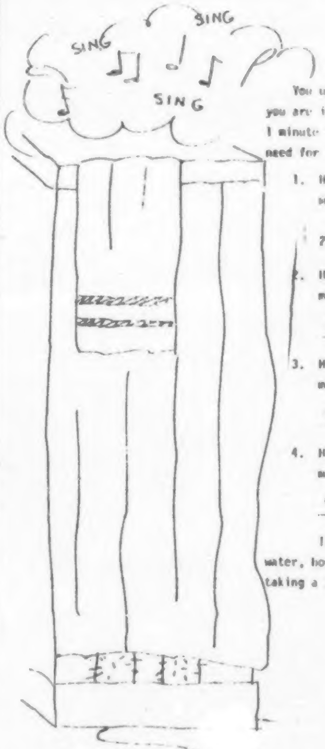
436 + 362 798 N	712 + 184 896 R	845 + 152 997 A	393 + 201 594 K
573 + 321 894 L	514 + 263 777 M	271 + 614 885 U	463 + 126 589 C



Put the letters of the answers that match on the lines.

WHAT DO YOU GET WHEN YOU CROSS A CHICKEN WITH A BELL?

A	N		A	L	A	R	M		C	L	U	C	K
997	798		997	894	997	896	777		589	894	885	589	594



You use about 8 gallons of water every minute you are in the shower. If you use 8 gallons for a 1 minute shower, find out how many gallons you will need for the following showers.

1. How many gallons would you use for a 2 minute shower?

   2 minutes X 8 gallons 16 gallons

2. How many gallons would you use for a 3 minute shower?

   3 minutes X 8 gallons= 24 gallons

3. How many gallons would you use for a 4 minute shower?

   4 minutes X 8 gallons = 32 gallons

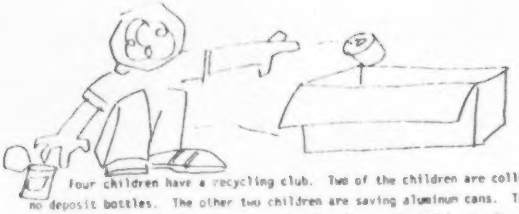
4. How many gallons would you use for a 9 minute shower?

   9 minutes X 8 gallons = 72 gallons

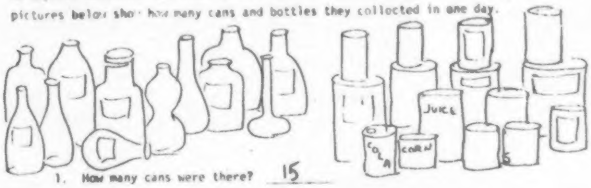
If a tub bath uses about 35 gallons of water, how many gallons of water would you save by taking a 3 minute shower?

$$\begin{array}{r} 35 \\ 24 \\ \hline 11 \end{array}$$ gallons

Answers: 354, 355, 356, 357



Four children have a recycling club. Two of the children are collecting no deposit bottles. The other two children are saving aluminum cans. The pictures below show how many cans and bottles they collected in one day.



1. How many cans were there? 15

2. Which number sentence tells how many bottles there were? Draw a line under the correct answer.

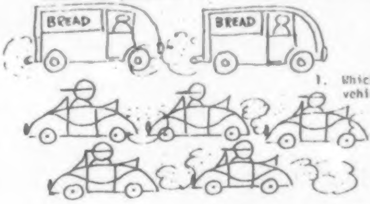
4 + 3 = ____
3 X 4 = 12
6 + 5 = ____

3 How many more cans than bottles were there? 3

4. If the recycling center paid the children \$.25 for all the bottles and \$.17 for all the cans, which number sentence shows how much money the children made all together?

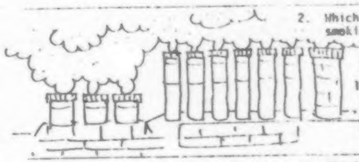
\$.25 X \$.17 = ____
\$.25 - \$.17 = ____
\$.25 + \$.17 = \$.42
\$.25 ÷ \$.17 = ____

DIRECTIONS: Here are some things that cause air pollution. Use the pictures to answer the questions. Do the work and draw a line under the correct answer.



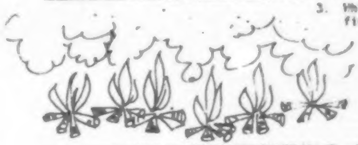
1. Which number sentence tells how many vehicles there are all together?

5 - 2 = ____
5 + 5 = ____
5 + 2 = 7



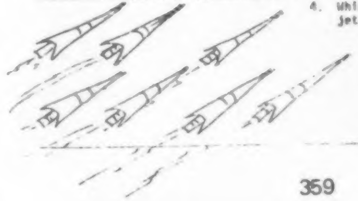
2. Which number sentence tells how many smoking chimneys there are all together?

2 + 4 = ____
10 - 4 = ____
7 + 3 = 10



3. Which number sentence tells how many fires there are all together?

3 X 2 = 6
5 + 2 = ____
9 - 4 = ____



4. Which number sentence tells how many jet planes there are all together?

3 X 4 = ____
9 - 2 = 7
7 + 1 = ____

The Recycling Club at John Muir School has made money by saving aluminum cans, newspapers, bottles, and even rags and cardboard. They would like to know how much money they have made this month.

DIRECTIONS: Change the number words to numerals. Add the amounts to find out how much money they have made.

From collecting newspapers: Two dollars, four dimes and five pennies	\$2.45
From saving aluminum cans: One dollar, eight dimes and one nickel	\$1.85
From no-deposit bottles: Four dollars, two dimes and nine pennies	\$4.29
From rags and cardboard: One dollar, three dimes and one nickel	\$1.35
All together they have made:	\$9.94

DIRECTIONS: Circle all the even numbers.

1 [✓ 2] 3 [✓ 4] 5 [✓ 6] 7 [✓ 8] 9 [✓ 10] 11 [✓ 12] 13 [✓ 14] 15 [✓ 16]

Follow the directions of each problem to read the energy message below.

1. On the first space, if 4 is an even number, write Water. If not, write Rocks.
2. On space 2, if 11 is an odd number, write wind. If not, write in.
3. On space 3, if 6 is an odd number, write your. If not, write and.
4. On space 4, if 11 is an odd number, write sun. If not, write head.
5. On space 5, if 15 is an even number, write this. If not, write were.
6. On space 6, if 14 is an even number, write the. If not, write is.
7. On space 7, if 9 is an odd number, write first. If not, write not.
8. On space 8, if 14 is an odd number, write the. If not, write kinds.
9. On space 9, if 2 is an even number, write of. If not, write right.
10. On space 10, if 7 is an odd number, write energy. If not, write answer.
11. On space 11, if 12 is an odd number, write try. If not, write used.
12. On space 12, if 8 is an even number, write by. If not, write once.
13. On space 13, if 16 is an odd number, write more. If not, write people.

Water . wind . and . sun
1 2 3 4

were the first kinds of
5 6 7 8 9

energy used by people
10 11 12 13

Answers: 358, 359, 360, 361

DIRECTIONS. Use the chart to answer the questions below.

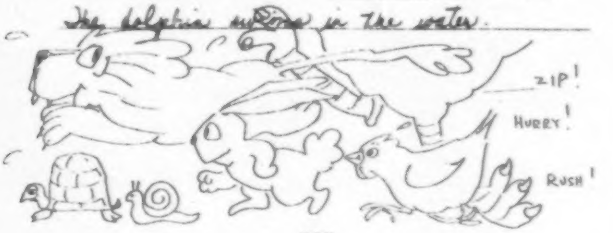
Animals move at different speeds for different reasons. A cheetah can run very fast to catch another animal for food. A snail crawls very slowly over a leaf to look for its food.

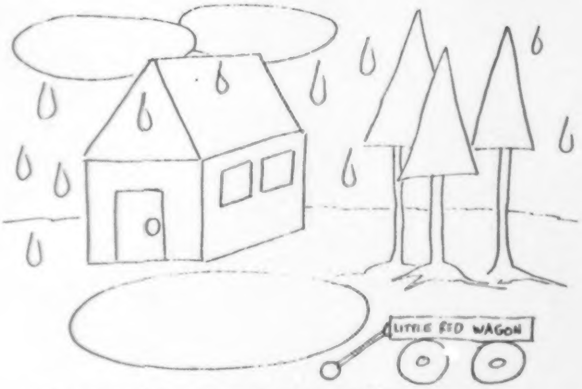
How Fast Can These Animals Go?

Lizard	10 mph. (miles per hour)
Cheetah	63 mph.
Pronghorn antelope	55 mph.
Ostrich	30 mph.
Dolphin	25 mph.

1. Write the name of the fastest animal. cheetah
2. How much faster is the ostrich than the dolphin? 5 miles an hour
3. How much faster is the pronghorn antelope than the lizard? 37 mph
4. How much faster is the cheetah than the pronghorn antelope? 8 mph
5. Could the cheetah catch the dolphin? no Why or why not?

The dolphin swims in the water.


ZIP!
HURRY!
RUSH!



Find the things that are shaped like circles. Color them yellow.
Find the things that are shaped liked triangles. Color them green.
Find the things that are shaped like squares. Color them brown.
Find the things that are shaped like rectangles. Color them red.
Find the things that are shaped like ovals. Color them blue.

The blue things are part of the water cycle.
Write the names of the things you colored blue.

clouds
raindrops
puddle

When an animal is extinct, it means that there aren't any more of that kind of animal left in the world. They have all died and will never be seen alive again.

DIRECTIONS: Read the story. Change the underlined numbers from expanded notation to standard notation. (ex. one hundred = 100)

HOME
90
MILES.

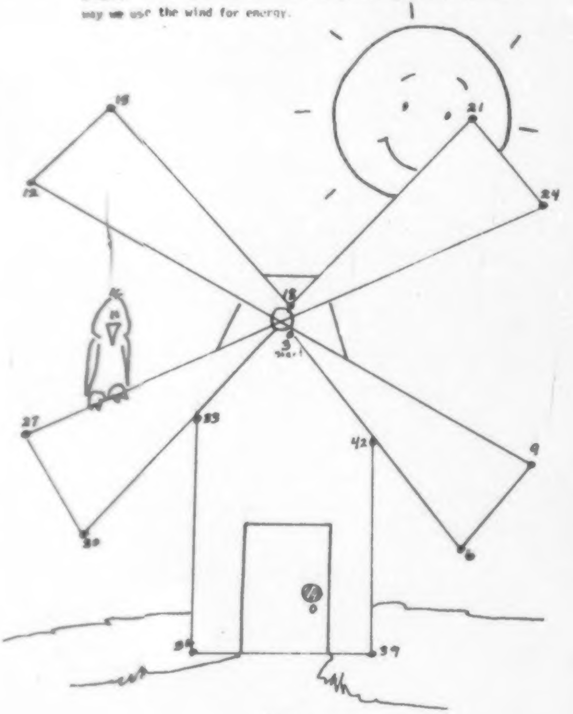
The Passenger Pigeon

The most common bird to be killed by man was the passenger pigeon. Large numbers of these birds were killed mostly for food. One store in New York handled about eighteen thousand (18,000) birds a day in the year one thousand eight hundred fifty five (1855). By one thousand eight hundred seventy nine (1879), almost five thousand (5,000) men worked as pigeon hunters. In this year over one billion birds were killed in just one state.

The last passenger pigeon nest was found in one thousand eight hundred ninety four (1894). The last passenger pigeon in the world, "Martha", died on September 1, one thousand nine hundred fourteen (1914) in the Cincinnati Zoo.

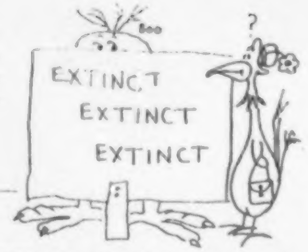
No one will ever see passenger pigeons flying wild again. They are an extinct animal.

DIRECTIONS: The sun, water, and wind were the first kinds of energy used by people. Count by 3's to connect the dots and you will find one way we use the wind for energy.



Answers: 362, 363, 364, 365

DIRECTIONS: Do the problems. Match your answers to the numbers under the blank spaces below. Write the letter that is in the box on the space. You will find the names of two extinct animals.



546 + 218 764 B	328 + 138 466 E	786 + 104 890 D	422 + 168 590 M	379 + 619 998 R	622 + 169 791 W
447 + 326 773 S	817 + 149 966 O	525 + 335 860 K	188 + 206 394 A	673 + 117 790 I	638 + 148 786 N

D O D O B I R D
890 966 890 966 764 790 998 890

and the

S E A M I N K
773 466 394 590 790 786 860

Jerry lives on a small farm. Houses have been built on the lands around the farm. Jerry has made a chart to show how many animals lived near the farm before the houses were built. His chart also shows how many of these animals are living near the farm now.

DIRECTIONS: Jerry wrote the numbers as Roman numerals. His chart would be easier to read if the numbers were written in standard notation. Change the Roman numerals to standard notation. Write the numerals on the blank spaces.

ANIMALS NEAR THE FARM

ANIMAL	Before the houses were built		After the houses were built	
Beavers	XX	20	XI	11
Coyotes	VI	6	II	2
Raccoons	XII	12	VIII	8
Rabbits	IX	9	XVI	16
Deer	V	5	I	1
Field Mice	VIII	8	XVIII	18
Foxes	XIV	14	III	3

Are there more of some animals since the houses were built?
Can you think of a reason why?

DIRECTIONS: The number in each sentence is written in expanded notation. Write the standard notation for each underlined number on the line after each sentence.

1. Each year, every man, woman and child in the United States throws away about one ton of paper, cans, bottles and garbage. 1
2. The thirty six children in Mrs. Jones class are starting a recycling center to help get rid of trash. 36
3. John has already saved forty four cans to recycle. 44
4. Barbara has collected ninety seven bottles. 97
5. The class has more than seventy two stacks of newspapers. 72
6. Three hundred average size books can be printed on paper made from one tree. 300
7. Seven children will take the newspapers to a paper company. 7
8. There are more than twenty three recycling centers in the Santa Clara Valley. 23
9. Sixteen people work at the center in Cupertino. 16
10. The rest of the four hundred eighty two students at the school would like to take part in the recycling center. 482

DIRECTIONS: Write the number that is missing in each pattern.

1. 10 12 14 16 18 This is the last letter.
2. 1 2 3 4 5 This is the second letter.
3. 5 10 15 20 25 This is the third letter.
4. 8 12 16 20 24
5. 10 20 30 40 50
6. 3 5 7 9 11 This is the fourth letter.
7. 3 6 9 12 15
8. 13 23 33 43 53 This is the first letter.

Use this code to find the letters to answer the question.

A 1	B 2	C 3	D 4	E 5	F 6	G 7	H 8	I 9	J 10	K 11	L 12	M 13	N 14	O 15
P 16	Q 17	R 18	S 19	T 20	U 21	V 22	W 23	X 24	Y 25	Z 26				

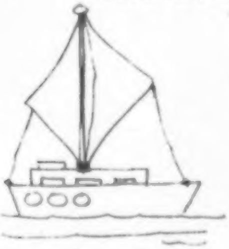
What is our most important resource? W A T E R

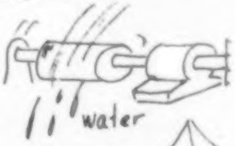
Answers: 366, 367, 368, 369

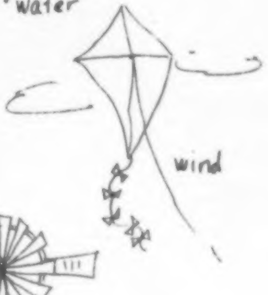
ENERGY

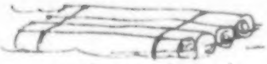
Energy is what makes things go. The sun, wind, and water were the first three kinds of energy used by people.

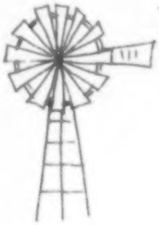
DIRECTIONS: Write 'wind' or 'water' under the pictures below to show which source of energy is being used.


wind or water


water


wind

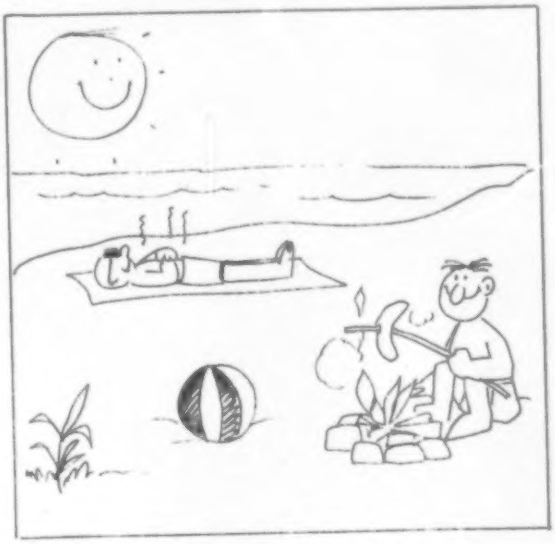

water


wind

ENERGY FROM THE SUN

Most of our energy comes to us from the sun. This is called solar energy. The sun warms the earth and gives us light. Plants need the sunlight to grow and make food. Animals need the food to live.

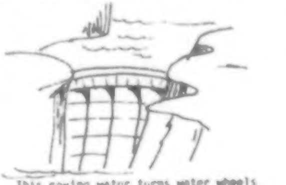
DIRECTIONS: Color all the things in the picture that are using or have used the sun's energy.

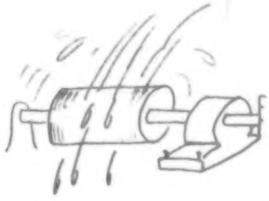


HYDRO POWER

Moving water can light our houses, cook our food, and help us to do many other things. The moving water can be used to make electricity. This is called hydro power.

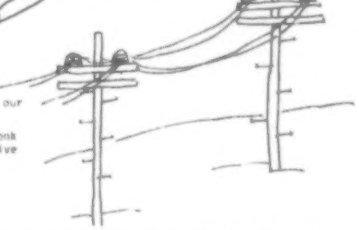
First, a wall is built across a river.
It is called a dam.
Water builds up behind the dam.
Some of the water is allowed to flow over or through the dam.





This moving water turns water wheels that run special machines called turbines or generators.

These machines change the energy of the falling water into electric power.

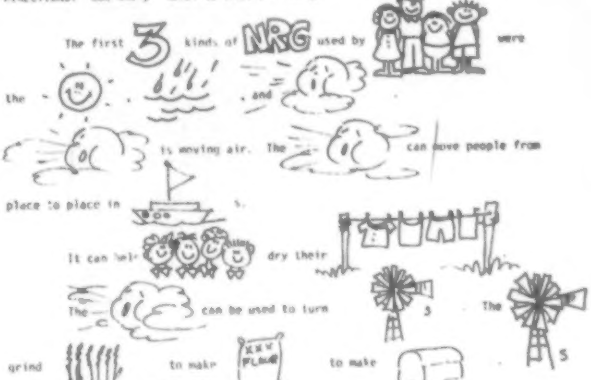


The electric power comes to our homes over wires.

We use the electricity to cook our food, keep us warm, and give us light.

DIRECTIONS: Write the names of things in your home that use electricity for power.

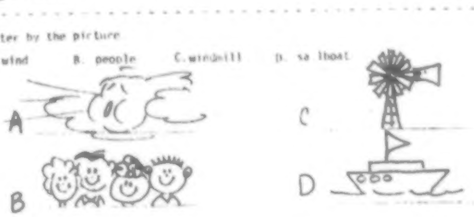
DIRECTIONS: Use the pictures to read the story.



The first 3 kinds of NRG used by were the , , and . is moving air. The can move people from place to place in s. It can help dry their . The can be used to turn s. The s grind to make to make . The can help us in many ways.

Put the letter by the picture

A. wind B. people C. windmill D. sailboat



Answers: 370, 371, 372, 373

DIRECTIONS: Use these words to fill in the blank spaces in the story.

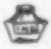
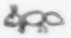
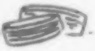
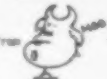
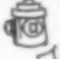
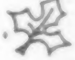
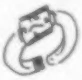
clouds drink oceans sun rain
rivers sewers

The Water Cycle

Most of the water on the earth is in the oceans. The water is salty there. Every day, the sun shines on the water and heats it up. Some water evaporates and becomes clouds. These move over the land and fall as rain and snow. The water runs over the land and into rivers. People can use this fresh water to drink, wash, and grow plants. After the people use the water, some of it goes into sewers. Then the water goes back to the ocean and the water cycle starts all over again.

DIRECTIONS: Use the pictures and letters to complete each sentence.
When you come to a + or - sign, add or subtract the letters or pictures shown.
Write the words on the blank spaces.

WATER

1. Animals need water to dr +  - drink
2. Water is needed to grow pl +  + s. plants
3. We use water for fighting f +  - t. fires
4. We can get energy or power from  + ving water. moving
5. This kind of energy is called  -ant + o power. hydro
6. We use water to keep things c +  - f + n. clean
7. People can travel on water by using - ok + cats - c. boats
8. Our most important natural resource is  - ch + er. water

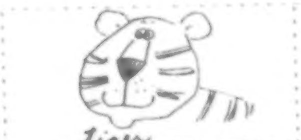
Endangered Animals

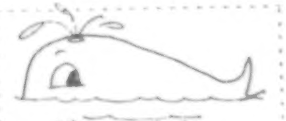
Some animals are endangered. This means that there aren't many left.

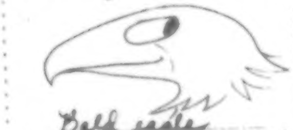
Some animals are endangered because the weather changes, they can't get enough food or water, or their habitat is destroyed. Sometimes, people kill too many animals and they become endangered.

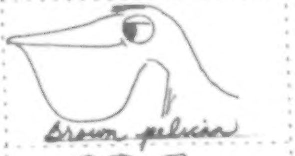
DIRECTIONS: Write the names of these endangered animals on the spaces under their picture.

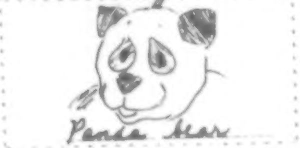
Blue whale Timber wolf Tiger
Brown pelican Bald eagle Panda bear

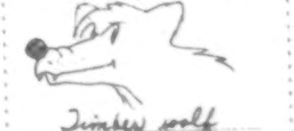

Tiger


Blue whale


Bald eagle


Brown pelican


Panda bear

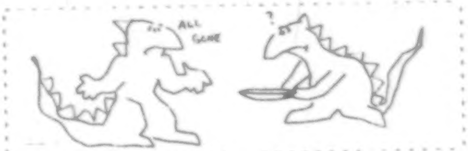

Timber wolf

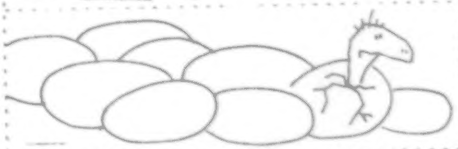
EXTINCT ANIMALS

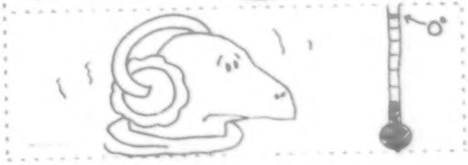
Animals or plants that once lived on the earth, but are no longer alive are called extinct. Dinosaurs are a good example of animals that are extinct. Dinosaurs were large lizards that lived in warm places. They needed lots of food, water, and space to live.

DIRECTIONS: Match the picture to the sentence that tells why dinosaurs became extinct. Write the numeral of the sentence under each picture. Color the pictures.

1. There was not enough food or water.
2. The climate became too cold.
3. Few baby dinosaur eggs hatched.







Answers: 374, 375, 376, 377

ADAPTATION

Plants and animals must be able to adapt to live. This means that if their
4

habitat changes, the plants and animals must adapt, or change, too.
9

Some animals adapt by changing their habitat. For example, some birds live
6 2

best in places where the weather is warm. If the weather changes and becomes cold,
3

they can fly far away to another warm place.
10

Some animals adapt by changing what they eat. Seagulls can eat fish, but if
5

there are no fish, they can eat many other things, too.
11

People can adapt by using their brains and hands to build or make things.
1 14

If the weather gets cold, people can put on a coat or build a warm house.
7 12

People can adapt or change more than any other animal.
8 13

DIRECTIONS: Find the answer to the silly riddle.
Use the story to find letters that match the numerals under the spaces.

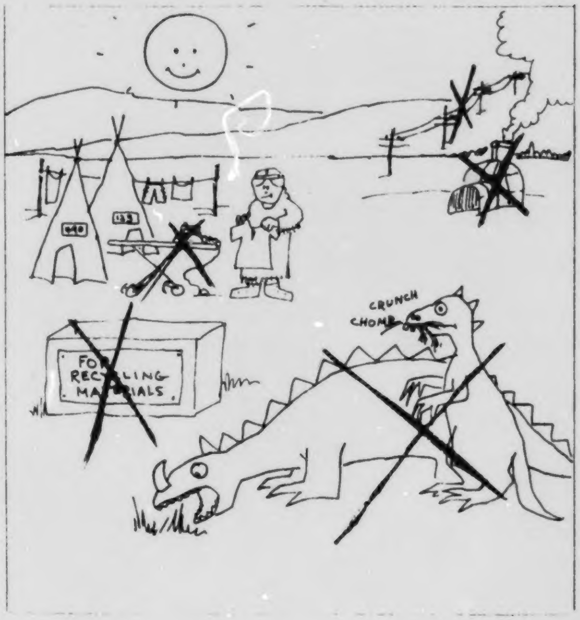
WHY DO BIRDS FLY SOUTH IN THE WINTER?

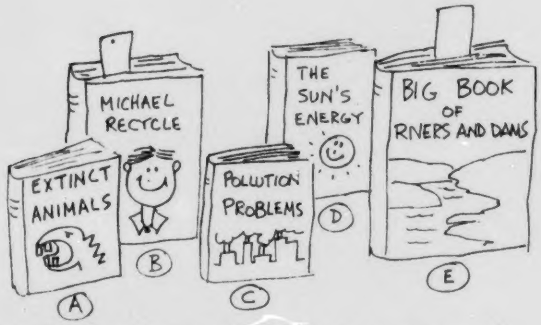
BECAUSE IT'S
1 2 3 4 5 6 2 7 8 6

TOO FAR TO
8 9 9 10 4 11 8 9

WALK!
12 4 13 14

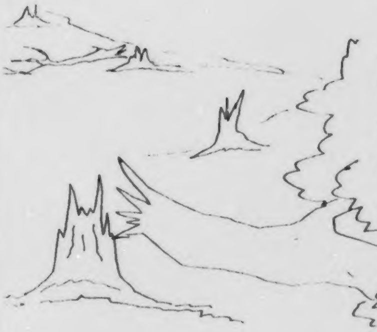
DIRECTIONS: Here is a picture of an Indian village in early California.
Make an X on all the things in the picture that are wrong.
Do you know why?





DIRECTIONS: Write the letter of the book you would read to find the answers to the following questions.

1. How do you use old aluminum cans to make new ones? B
2. What happened to the passenger pigeon? A
3. What is solar power? D
4. How are litter and trash spoiling our environment? C
5. How do people use water to make electricity? E
6. Where have all the dinosaurs gone? A
7. How can old newspapers save our trees? B
8. Why does smog hurt your eyes? C



Use this code to read the message.

A 2	B 4	C 6	D 8	E 10	F 12
G 14	H 16	I 18	J 20	K 22	L 24
M 26	N 1	O 3	P 5	Q 7	R 9
S 11	T 13	U 15	V 17	W 19	X 21
Y 23	Z 25				

Good luck.

THAT PAPER IS MADE FROM
13 16 2 13 5 2 5 10 9 18 11 26 2 8 10 12 9 3 26

TREES IS SOMETHING WE
13 9 10 10 11 18 11 11 3 26 10 13 16 18 1 14 19 10

ALL KNOW. SO, IF WE WASTE
2 24 24 22 1 3 19 11 3 18 12 19 10 19 2 11 13 10

OUR PAPER, MORE TREES
3 15 9 5 2 5 10 9 26 3 9 10 13 9 10 10 11

WILL HAVE TO GO!
19 18 24 24 16 2 17 10 13 3 14 3

Answers: 378, 379, 380, 381

FOREST FIRES

Fire can destroy large parts of our environment. Some forest fires are caused by nature, but most are caused by people. A forest fire kills animals and plants. When there is a forest fire, even the animals that can run away lose their homes and the places where they get their food.

DIRECTIONS: Read the newspaper stories. Draw a line under the sentence that tells how the fire started. Write people or nature on the spaces to show who caused the fire.

FIRE BURNS 500 ACRES

Forest rangers believe that the fire was started by a campfire that was left burning. Five hundred acres were destroyed by the fire.

people

FOREST FIRE UNDER CONTROL

The fire in Smokey Mountain Park has been put out. Firemen think it was caused by a burning cigarette thrown from a car.

people

FIRE IN NATIONAL FOREST

Lightning struck a large tree in the Green Pines forest. The tree burst into flames. The fire was first seen by Rangers in the lookout station on White Mountain.

nature

RANGERS PUT OUT FIRE

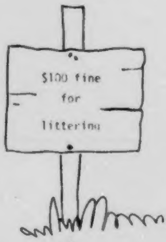
A broken glass bottle and the heat of the sun started the fire in Blue Ridge Park. The fire was quickly put out by the fast action of the Park rangers.

people/nature

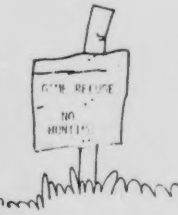
HELPING OUR ENVIRONMENT

Many people care about our environment. They have made laws to protect plants and animals that are endangered and to stop pollution.

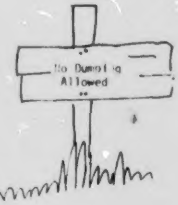
DIRECTIONS: Under the signs below, put a "1" if the law is to protect plants or animals. Put a "2" if the law is to stop pollution of the air, water, or land.



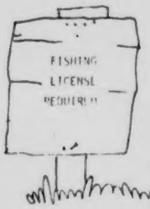
2



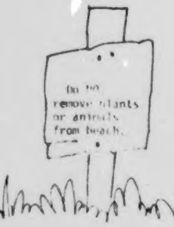
1



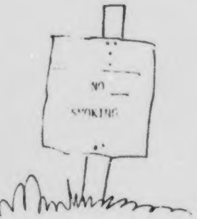
2



1

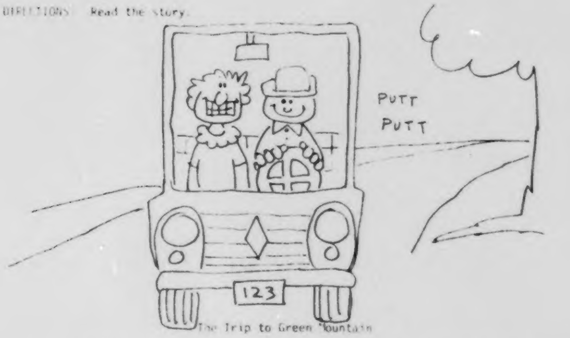


1



2

DIRECTIONS: Read the story.



The Trip to Green Mountain

Joe and Betty were going camping on Green Mountain. They left their house early in the morning because there were many things to see along the way.

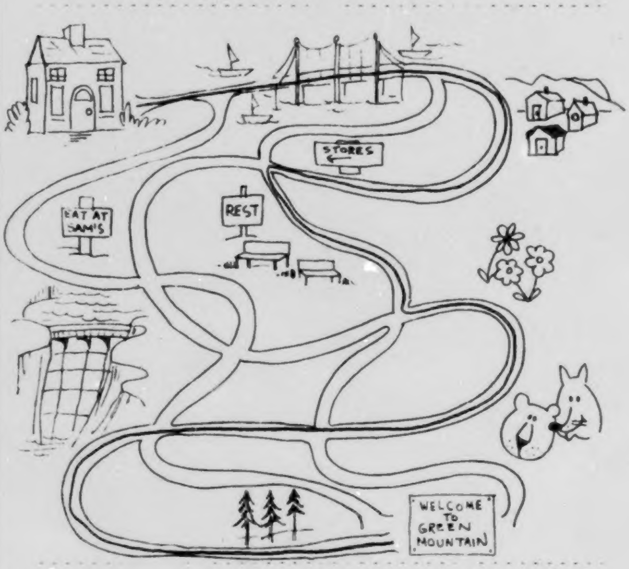
First, they drove over the Golden Gate Bridge. They saw many sailboats in the water below. Next, they passed many new houses that were being built on the hillsides.

Joe was beginning to get hungry. He saw a sign that showed there were many stores along one of the roads. But Betty had packed a lunch to eat on the way, so they did not go that way. Soon, they came to a roadside rest stop where they ate their lunch. After lunch, they began to drive again. Once, Betty asked Joe to stop the car so that she could take pictures of some pretty wildflowers growing near the road.

A few hours later, Betty and Joe stopped at Hetch Hetchy to see the large dam that provides water and electricity for the people who live far away in San Francisco.

As they began to see more and more trees, they knew they were getting closer to the Green Mountain campground. Soon, they were there.

DIRECTIONS: Use the story to trace the roads that Betty and Joe took to get to the Green Mountain campground.



Write the names of three things Joe and Betty passed on the way that were made by people.

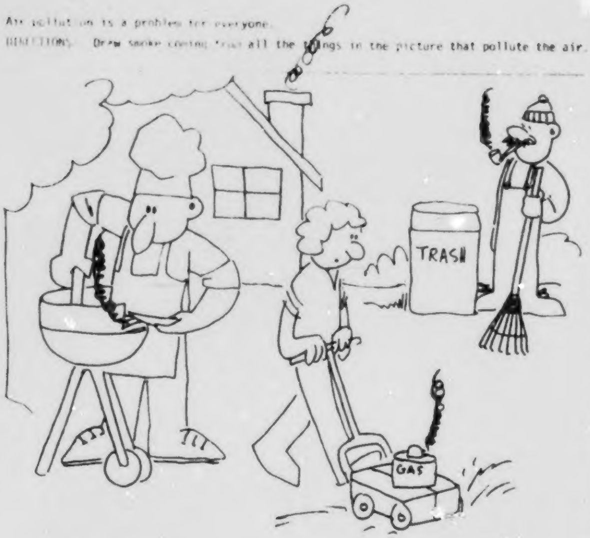
bridge houses dam

Did these things change the environment?

Answers: 382, 383, 384, 385

Air pollution is a problem for everyone.

DIRECTIONS: Draw smoke coming from all the things in the picture that pollute the air.



What could you change to help keep our land clean?

THINK! There are lots of ways you can help to get rid of pollution.

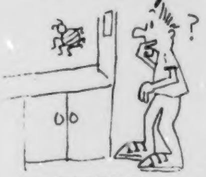
DIRECTIONS: Read each story. Think of an answer for the question. Write it.

Rex bought three new comic books. They were fun to read. After he read them all, he threw them in the garbage can. This made more trash pollution. What else could Rex have done with the comic books?

He could have shared them with a friend or sold them at the flea market.

It was a warm and sunny day. Jackie wanted to go to Carolyn's house to play. Carolyn lived three blocks away so Jackie had her mother drive her there. This made more air pollution. What else could Jackie have done?

Jackie could have walked or biked to Carolyn's house



Russ saw a spider on the kitchen wall. He quickly caught the spider with a tissue and flushed them both down the toilet. This made more water pollution. What else could Russ have done with the spider?

Russ could have caught the spider without hurting it and then put it outside so it could catch bugs and flies

DIRECTIONS: Put an X on the word in each row that does not belong.

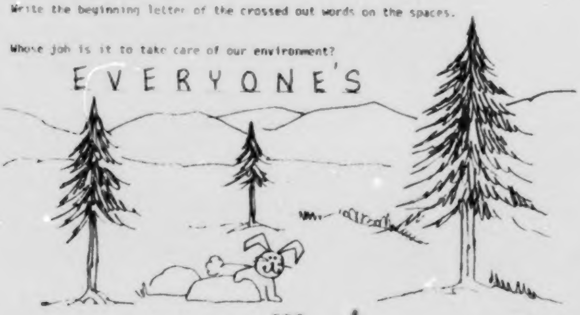
1. deer fox ~~eagle~~ bear
2. bridge dam highway ~~volcano~~
3. dinosaur ~~elephant~~ passenger pigeon dodo bird
4. tiger panda ~~raccoon~~ timber wolf
5. ~~yellow~~ rain rivers clouds
6. wood paper ~~oil~~ cardboard
7. smog ~~nature~~ smoke dust
8. litter trash garbage ~~earth~~
9. protect ~~sugar~~ save use wisely

Answer the question below.

Write the beginning letter of the crossed out words on the spaces.

Whose job is it to take care of our environment?

E V E R Y O N E ' S



Here is a checklist of somethings you can do to help protect our environment. Add some of your own ideas in the bottom spaces.

Fill out the checklist by beginning with anything you think goes in the "Easy, I'll do it" column. Then move on to the next column, and the next.

Compare your checklist with other people's. Where do you stand? Try doing the checklist again in a month. Have you changed? Remember, changing to even one good ecology habit is a start.

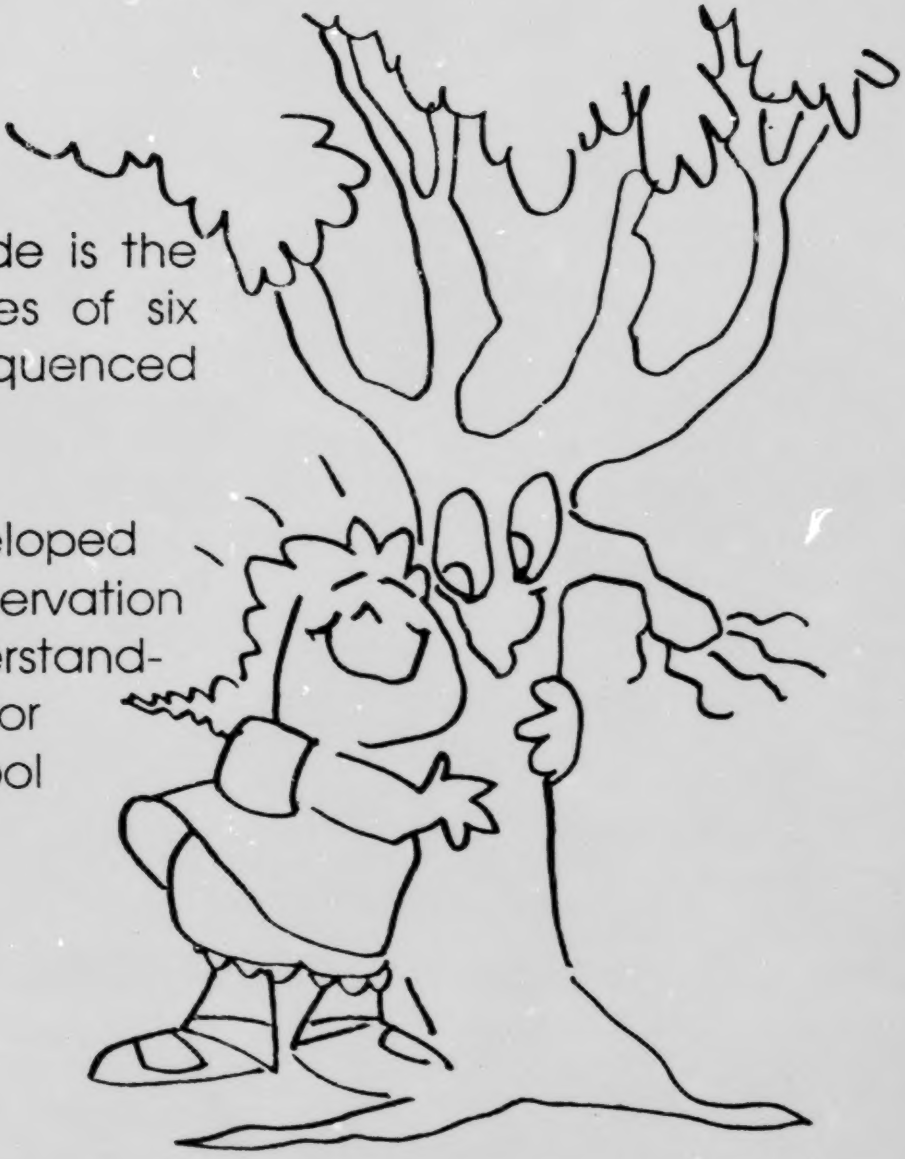
I can't	I don't want to	I might	I'll do it sometimes	Easy, I'll do it	
					walk instead of asking for a ride
					ride a bike instead of asking for a ride
					throw papers in trash cans
					use dishes instead of paper plates and paper cups
					save newspapers for recycling
					use the back of writing and drawing paper
					save envelopes and wrapping paper to use again
					save cans and bottles for recycling
					use plastic bags over and over
					avoid buying things in plastic containers or wrappers
					turn off all water faucets tightly
					fix drips and leaks
					don't let water keep running when you brush your teeth
					run dishwashers and washing machines only with full loads
					don't use the toilet as a wastebasket
					turn off lights when you're not using them
					plant trees
					fix things instead of throwing them out
					give outgrown clothes to someone smaller
					share books and games with your friends
					talk to people about ecology

Answers: 386, 387, 388, 389

The criterion-referenced test answer key was missing from this section prior to its being submitted to the ERIC Document Reproduction Service.

Level 4

Conservation For Children



This activity guide is the fourth in a series of six grade level sequenced guides.

It has been developed to promote conservation awareness, understanding and action for elementary school children.

© Cupertino Union School District

An ESEA Title IV-C Project, Number 6298

Produced by Cupertino Union School District

John Muir Elementary School
6560 Hanover Drive
San Jose, CA 95129
(408) 252-5265

Carl W. Krause, Superintendent

Board of Education

Robert D. Hall, President
Severene Bylin
Roger C. Halstead
Valerie Harrison
Claire Hobbs

PROJECT STAFF

State Consultant: William A. Johnson

Associate Superintendent: William Zachmeier

Project Administrator, Principal: Rex Wetzel

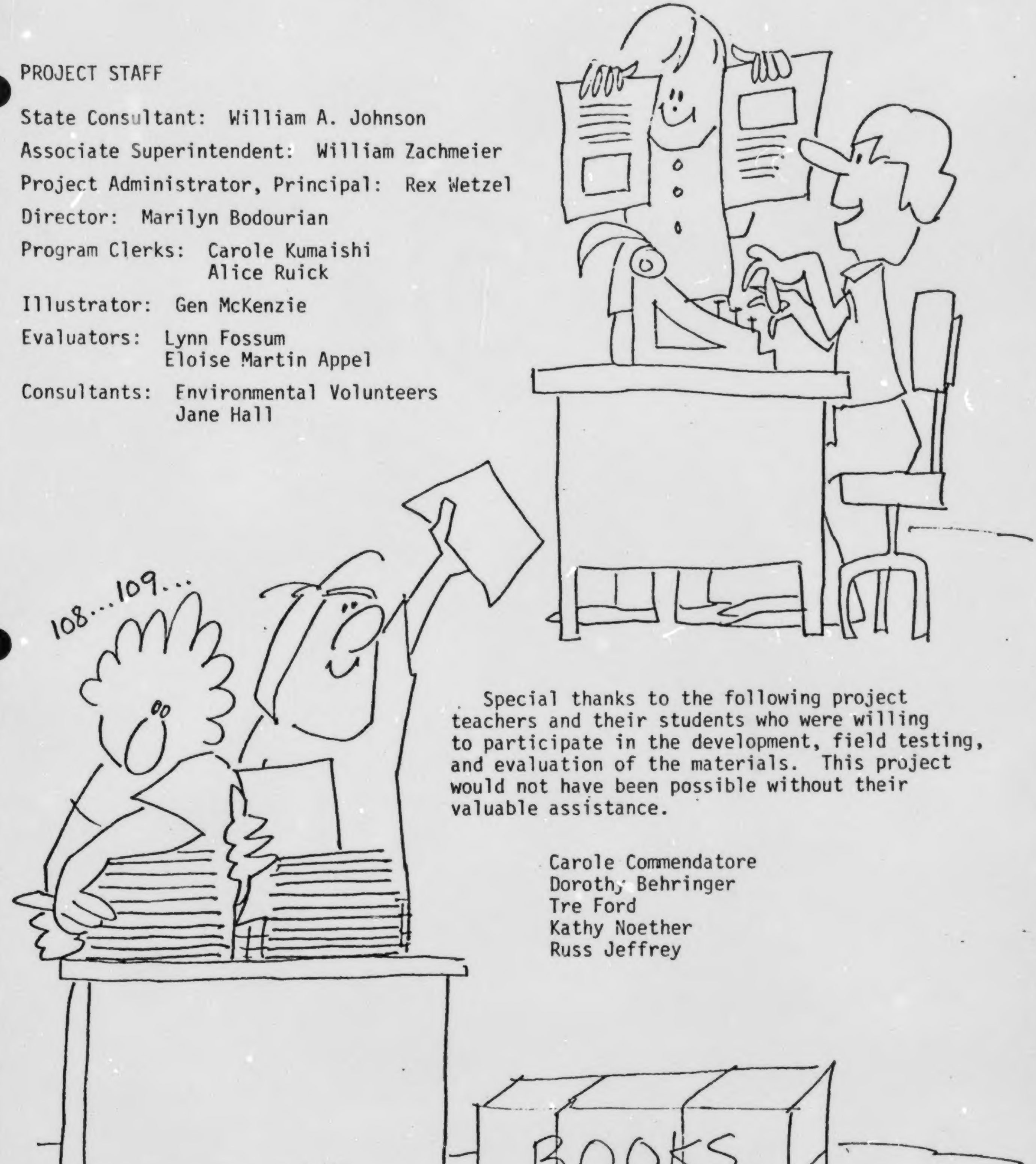
Director: Marilyn Bodourian

Program Clerks: Carole Kumaishi
Alice Ruick

Illustrator: Gen McKenzie

Evaluators: Lynn Fossum
Eloise Martin Appel

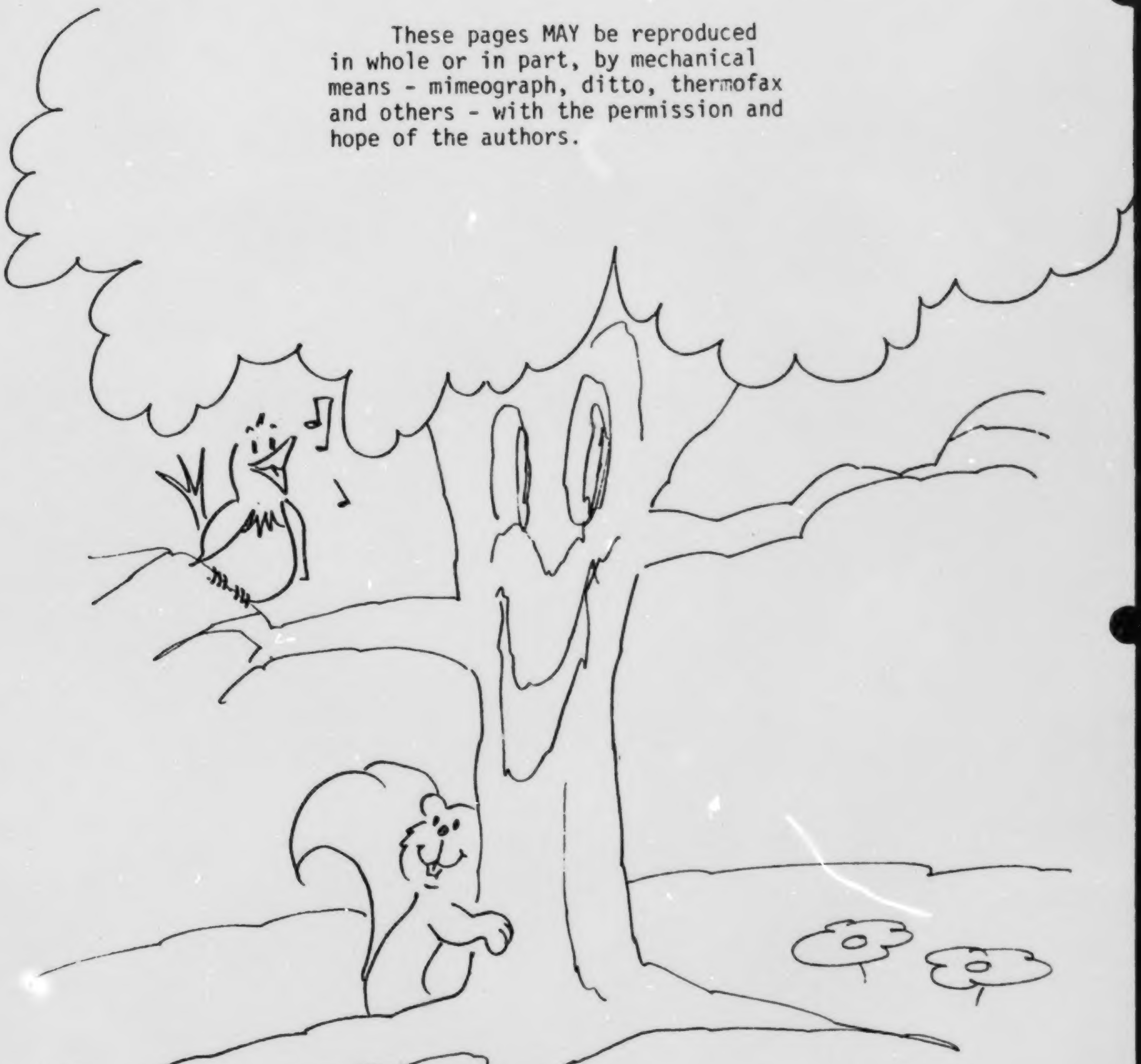
Consultants: Environmental Volunteers
Jane Hall



Special thanks to the following project teachers and their students who were willing to participate in the development, field testing, and evaluation of the materials. This project would not have been possible without their valuable assistance.

Carole Commendatore
Dorothy Behringer
Tre Ford
Kathy Noether
Russ Jeffrey

These pages MAY be reproduced in whole or in part, by mechanical means - mimeograph, ditto, thermofax and others - with the permission and hope of the authors.



The pages in this book are printed on 100% recycled paper.

TABLE OF CONTENTS

PART 1

Introduction
Purpose, contents, how to use the materials 400

Conservation Concepts 402

Criterion Referenced Test 403

Test-Worksheet Correlation 405

Content Guide 406

PART 2

Student Worksheets

Language Arts 410

Mathematics 450

Social Studies, Science 470

Related Activities 490

APPENDIX

Answers
Student Worksheets
Criterion Referenced Test

INTRODUCTION

PURPOSE:

The CONSERVATION FOR CHILDREN materials were developed to enable teachers to provide relevant conservation information for students in an easy and practical manner.

As our natural resources decline, both in quality and quantity, the importance of conservation education cannot be understated. As children become aware of environmental problems, they can better understand the precedents and consequences of such and their interdependency with the environment. This knowledge will hopefully lead to positive action.

CONTENTS:

Each grade level guide includes:

1. Conservation Concepts -

   These grade level concepts have been determined by teachers to meet the basic interests of students and to correlate with other grade level subject matter.

2. Criterion Referenced Test -

   A student test designed to measure pre and post knowledge of the grade level conservation concepts.

3. Class Record Sheet -

   A recording sheet for teacher use in programming instruction. This page also correlates the test items and student worksheets.

4. Content Guide -

   The guide correlates accepted basic skill objectives and conservation topics. The listing of student worksheets includes

forty pages of language arts activities, twenty pages of mathematics, twenty pages of social studies and science, and ten pages of related activities.

5. Student Worksheets -

   Ninety worksheets which integrate basic skills objectives and conservation information. The worksheets were planned and developed by students and teachers and are intended for duplication. They are readily usable in the classroom and require no additional materials, time or space. These worksheets were designed to be relevant, motivating and fun for children.

USING THE MATERIALS:

The CONSERVATION FOR CHILDREN materials may be used as a primary resource for teaching basic skills, as supplementary materials to a core program, as enrichment activities, skill review, or as a unit of study.

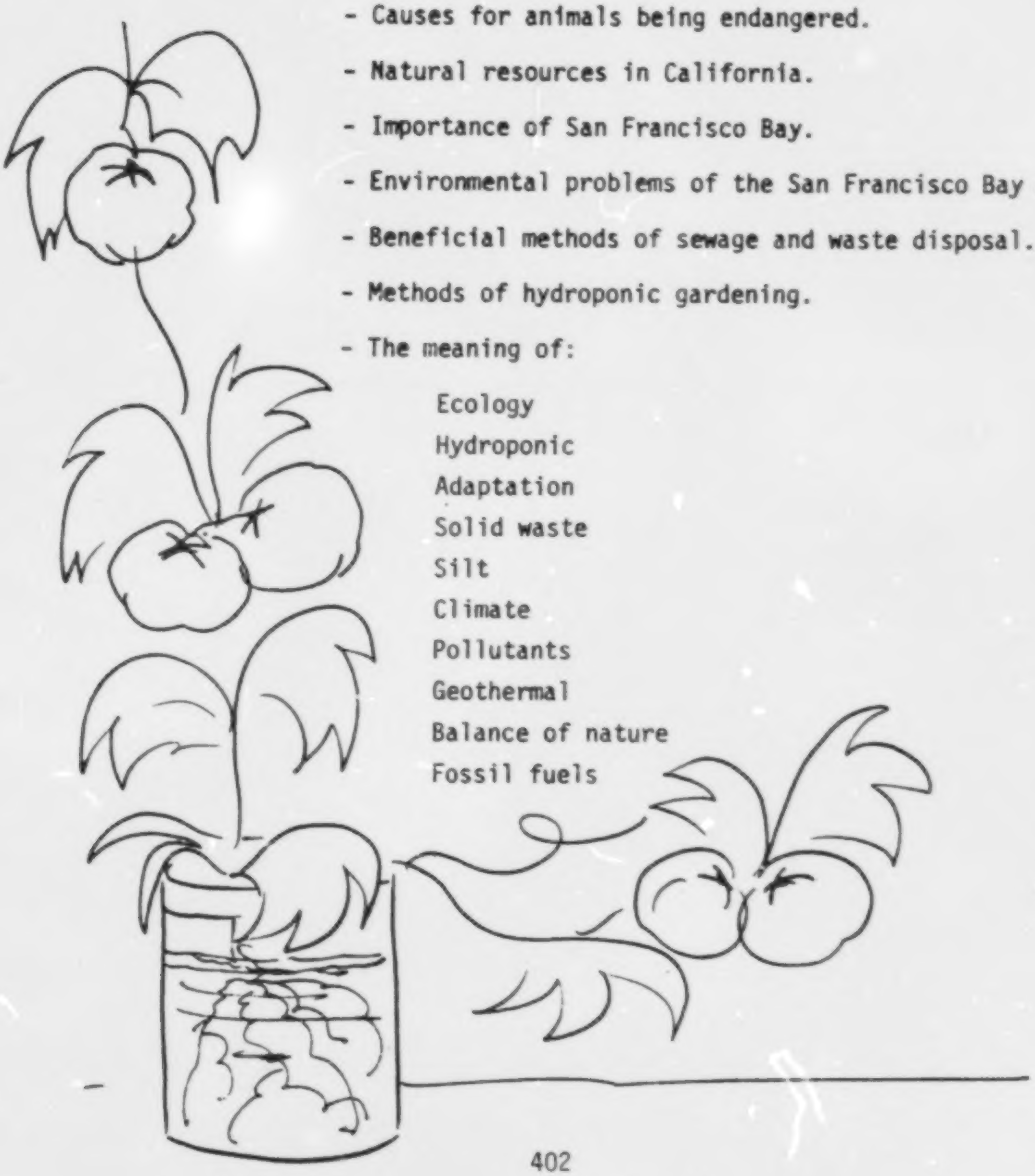
The worksheets have purposefully not been sequenced or arranged in any order, other than subject area, to encourage teachers to pick and choose those that will meet the needs of their students. Teachers may use the Content Guide to identify basic skills and/or conservation topics for each worksheet. Conservation concepts are covered in each basic skill area and are presented in several worksheets with varying degrees of difficulty. Each worksheet is independent of the others.

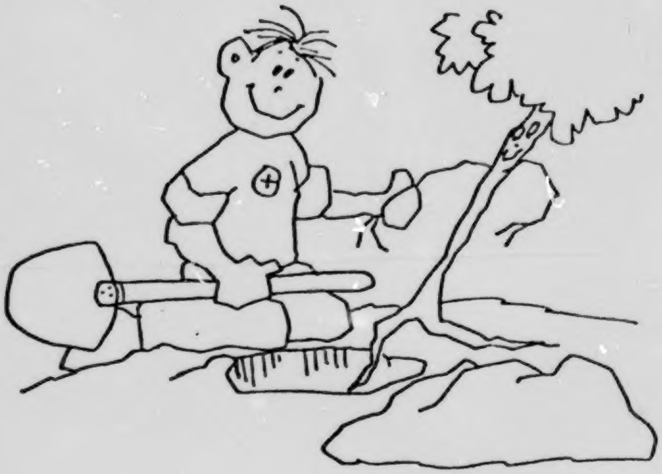
The Criterion Referenced Test is included for teachers who want to assess student growth in conservation knowledge. Recording pretest results on the class record sheet will enable teachers to program the materials to meet individual and group needs.

LEVEL 4 - CONCEPTS

CHILDREN WILL LEARN

- Man's effect on the balance of nature.
- Causes for animals being endangered.
- Natural resources in California.
- Importance of San Francisco Bay.
- Environmental problems of the San Francisco Bay area.
- Beneficial methods of sewage and waste disposal.
- Methods of hydroponic gardening.
- The meaning of:
  - Ecology
  - Hydroponic
  - Adaptation
  - Solid waste
  - Silt
  - Climate
  - Pollutants
  - Geothermal
  - Balance of nature
  - Fossil fuels





CONSERVATION FOR CHILDREN

Criterion Referenced Test (Level 4)

Name ______________________________

Date ______________________________

DIRECTIONS: Read the questions.
Write your answers on the blank spaces.

1. List four natural sources of energy found in California.

______________________________ ______________________________

______________________________ ______________________________

2. Write three reasons why some animals are 'endangered'.

   1. ______________________________
   2. ______________________________
   3. ______________________________

3. What is 'hydroponic gardening'?

____

4. Write the word that means 'the study of the relationship of living things to their environment and to each other'.

____

5. List three reasons San Francisco Bay is important.

   1. ______________________________
   2. ______________________________
   3. ______________________________

6. Write three environmental problems of the San Francisco Bay.

1. ______________________________

2. ______________________________

3. ______________________________

7. List three ways pollution can hurt plants or animals.

1. ______________________________

2. ______________________________

3. ______________________________

8. List three ways people have hurt the environment.

1. ______________________________

2. ______________________________

3. ______________________________

9. Write three ways people can help the environment.

1. ______________________________

2. ______________________________

3. ______________________________

10. Complete the sentences with the correct word.

1. 'Hydro' is a Greek word that means ____________________.

2. Energy produced from underground steam and heat is called ____________________.

3. Some companies are burning garbage to make ____________________.

CONSERVATION FOR CHILDREN

Class Record Sheet
Criterion Referenced Test - Grade 4

Question #	No. right on Pre-test	No. right on Post-test	Student Worksheets
1. List four natural sources of energy found in California.			439, 446, 447, 450 451, 472, 473, 479 483, 487, 489
2. Write three reasons why some animals are 'endangered'.			415, 417, 419, 444 456, 466, 467, 471 475
3. What is 'hydroponic gardening'?			420, 425, 426, 454 459, 482
4. Write the word that means 'the study of the relationship of living things to their environment and to each other'.			410, 455
5. List three reasons San Francisco Bay is important.			433, 443, 448, 452 476, 478, 484, 488
6. Write three environmental problems of the San Francisco Bay.			412, 413, 430, 443 458
7. List three ways pollution can hurt plants or animals.			411, 415, 416, 421 430, 435, 462, 465 486
8. List three ways people have hurt the environment.			412, 414, 416, 421 430, 435, 439, 440 458, 465, 474, 477 486
9. Write three ways people can help the environment.			414, 418, 422, 424 425, 431, 432, 438 440, 449, 453, 457 460, 461, 463, 464 469, 477
10. Complete the sentences . 1. 'Hydro' is a Greek word that means ______________.			425, 426, 459, 482
2. Energy produced from underground steam and heat is called ______________.			446, 468, 480
3. Some companies are burning garbage to make _________.			428, 429

Page No.	Skill	Conservation Topic	District Curriculum
Language Arts			
410	Context clues	Relationships, living things	
411	Literary comprehension	Litter, animals	
412	Topic sentences	Beach litter	
413	Literary comprehension	San Francisco Bay	
414	Interpretive comprehension	Mans' effect on environment	
415	Main idea, paraphrasing	Endangered animals	
416	Sequencing	Pollution	
417	Cause and effect	Endangered animals	
418	Literal comprehension	Recycled paper	
419	Context clues	Endangered animals	
420	Interpreting TV schedule	General	
421	Sentence completion	Noise pollution	
422	Abbreviations	Back yard habitats	
423	Inferences	Habitats/biomes	
424	Comp/Incomplete sentences	Packaging, shopping	
425	Following directions	Plants	
426	Vocabulary development	Hydroponics	
427	Vocabulary development	Weather	
428	Spelling, mis-	Refuse, energy	
429	Spelling	Solid waste	
430	Complete subject, predicate	Smog	
431	Verb endings	General	
432	Punctuation	General	

Page No.	Skill	Conservation Topic	District Curriculum
433	Capitalization	San Francisco Bay, salt	
434	Syllables	Vocabulary	
435	Verb agreement, is/are	Pollution	
436	Contractions	Conservation methods	
437	Adjectives	Adaptation	
438	Compound words	Environmental laws	
439	Homonyms	Logging	
440	Synonyms	Clearcutting trees	
441	Vocabulary development	Gardening	
442	" " (2 pages)	"	
443	Spelling	San Francisco Bay	
444	Alphabetical order	Endangered animals	
445	Similes	Animals	
446	Verb-subject agreement	Geothermal energy	
447	Nouns	California energy sources	
448	Verbs	Marshlands	
449	Fact/fantasy	Conservation methods	
Math			
450	Numerical order	Calif. natural resources	
451	Subtraction, 2 pl.	Natural resources, trees	
452	Equivalents	San Francisco Bay, products	
453	Time, hour and ½ hour	Conservation efforts	
454	Division, 1 pl. divisor	Vocabulary, hydroponics	
455	Graphs	Vocabulary, ecology	

Page No.	Skill	Conservation Topic	District Curriculum
456	Subtraction, wd. problems	Habitat loss	
457	Mult., div., wd. problems	Recycling	
458	Subtraction, wd. problems	San Francisco Bay, problems	
459	Addition, money	Hydroponics	
460	Money equivalents	Recycling	
461	Time, logic	Balance of nature	
462	Word problems, 2 step	Litter, effect on animals	
463	Word problems, multiplying	Man's effect on nature	
464	Bar graphs	Transportation	
465	Graphs	Noise pollution	
466	Expanded notation	Endangered animals	
467	Expanded notation	Endangered animals	
468	Use of signs, + - X ÷	Vocabulary, geothermal	
469	Measurement, qt. to gal.	Water usage	
Social Studies/Science			
470	Literal comprehension	Gold mining	
471	Following directions	Whaling	
472	Literal comprehension	Oil	
473	Map reading	California energy sources	
474	Literal comprehension	Land use	
475	Literal comprehension	California State animal	
476	Decoding	Marshlands	
477	Interpretive comprehension	Environmental changes	
478	Map reading	San Francisco Bay	

Page No.	Skill	Conservation Topic	District Curriculum
479	Literal comprehension	Redwood trees	
480	Use of diagrams	Geothermal energy	
481	Literal comprehension	Rock and mineral products	
482	Sentence completion	Hydroponics	
483	Categorizing	Natural resources	
484	Sentence completion	San Francisco Bay, climate	
485	Interpretive comprehension	Tree rings	
486	Sentence completion	Smog	
487	Classification	Renewable resources	
488	Following directions	Salt	
489	Categorizing	Metals	
Related Activities			
490	Introduction		
491	Arts and Crafts	Garden markers, using recycled materials	
492	Arts and Crafts	Fragrance jars	
493	Arts and Crafts	Kitty toy, grow and make	
494	Growing Plants	Herbs	
495	Growing Plants	Terrariums	
496	Music	"It's A Small World"	
497	Send Aways	Conservation information	
498	Send Aways	Conservation information	
499	Student bibliography	Conservation books, fiction and fact	

Name ____________________________

DIRECTIONS: Use the words in the box to fill in the blank spaces in the story below. Read the story again to be sure it makes sense.

decay plants environment protect
oxygen dependent food remember

Ecology is the study of the relationship of living things to their ______________________ and to each other. We share our environment, the earth, with all living things, both ____________ and animals. We are ____________________ on each other.

For example, plants add ____________ to the air for us to breathe. We, in turn, breathe out carbon dioxide which the plants need. Also, as dead plants ___________, they make the soil richer for growing new plants. Many animals, including man, use these plants for ___________.

We should ____________________ that all plants and animals need the earth's air, water, and land to live. Because we are dependent on each other, we must ________________ the land, air, and water that we share.

Name ______________________________

DIRECTIONS: Read the story. Draw a line under the best answers to the questions.

Every now and then something happens that shows how man's carelessness can affect other animals in his environment. The animal in this true story was a Risso dolphin, normally found only in mid-ocean.

People at Marineland, a zoo for sea life just south of Los Angeles, began receiving calls reporting that a dolphin,that seemed to be hurt , was seen in San Pedro Harbor. It is against the law to collect dolphins near shore unless they are ill and attempt to beach themselves. The dolphin finally did so and was rescued by the Marineland crew. The dolphin had two main problems - he couldn't swim and he wouldn't eat. The trainers at Marineland patiently tried feeding him and swimming with him in a small tank at the zoo.

At first he began to get better and the trainers had high hopes. But then, 10 days after he had been picked up on the beach, the dolphin died. He had not been able to eat. An examination was held, and inside the dolphin were found: 20 to 25 giant 30-gallon plastic trash bags, two plastic 6-pack beer holders, and about 25 feet of plastic twine. In all, there were eight pounds of plastic litter inside the dolphin.

1. A good title for this story would be:

   It's Fun to Go to the Seashore
   Litter Harms Animals
   Man Should Not Feed Plastic to Animals

2. The dolphin was first seen:

   swimming in San Pedro Harbor.
   at Marineland.
   in mid-ocean.

3. The Marineland crew tried to:

   train the dolphin to do tricks.
   remove the plastic litter.
   get the dolphin to eat and swim.

4. It is against the law to:

   feed dolphins.
   catch dolphins in the water near shore.
   help them when they are sick.

5. The dolphin died because:

   he swam too far from his home.
   he was old.
   he ate litter left by people.

Name ______________________________

Directions: Read the story. Draw a line through the sentences that do not belong in the story.

Litter on the Beach

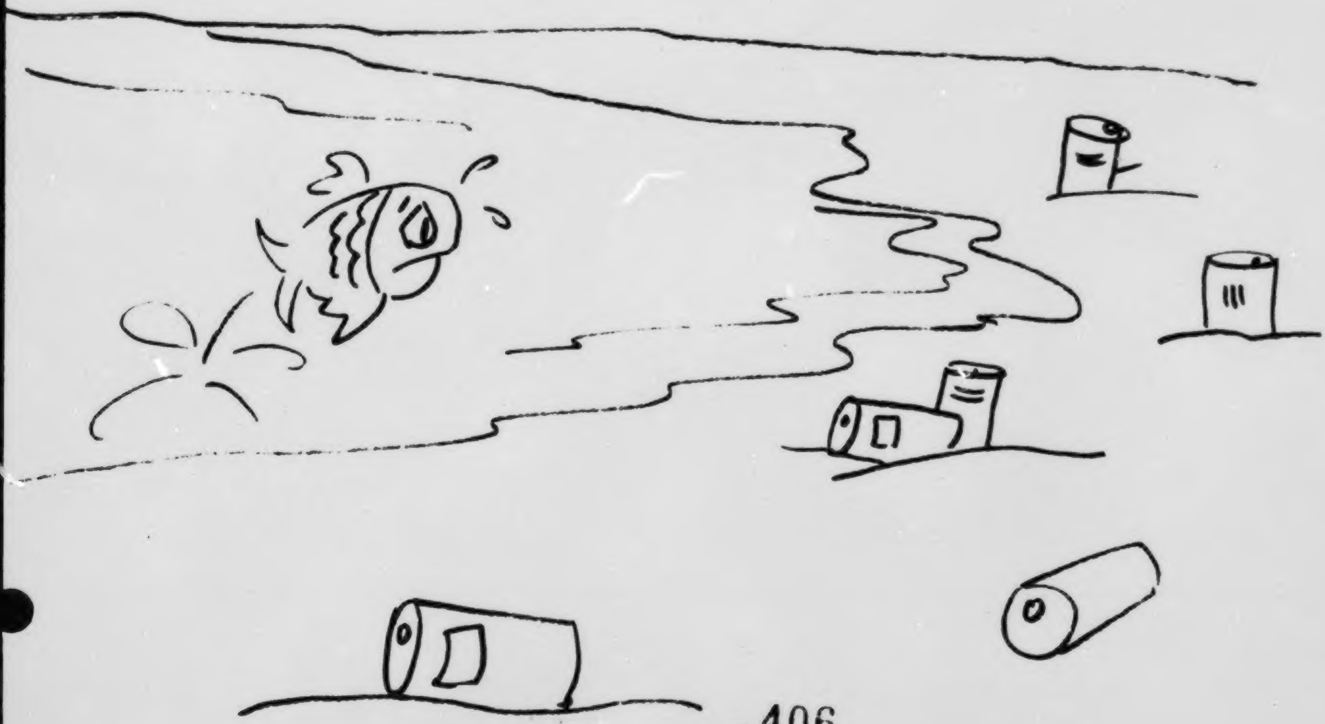
We see all kinds of litter on the beach. The cans, bottles and papers that have been left by people are ugly to look at. We like to swim in July.

Some beach litter is made of metal. When it rains, the rivers and lakes fill up again. These metal things often have sharp edges which can harm people and wildlife.

Some metals are worse than others. Metals that rust contain iron. Car exhaust is a major source of air pollution. You can tell if the metal is iron because it will stick to a magnet. Iron comes from the earth. Trees provide us with wood to build houses. Iron will keep rusting until it is part of the earth again.

Sunday is the first day of the week. Some cans are made of aluminum. Aluminum will not rust. A magnet will not stick to it. These cans will never break down and become part of the earth again.

Both kinds of metal litter are bad. We have trash cans in our classrooms at school. It takes a long time for cans made of iron to rust. But aluminum cans will litter our beaches forever unless they are picked up.



Name ______________________________

DIRECTIONS: Use the words in the box to fill in the blanks in the story. Read the story again to answer the questions at the bottom of the page.

problems shrunk dams deep dumping
coast flow originally life dirt

SAN FRANCISCO BAY

The San Francisco Bay is the largest bay on the __________________ of California. The Bay _________________________ had a surface area of 680 square miles. But by 1969, the Bay had ____________________ to 400 square miles. This was caused by _______________________ dirt and garbage along the shores. Also, many __________________ were built on rivers which flow into the Bay. The __________________ of water into the Bay became less. Silt, a fine powdered __________________, began collecting on the bottom of the Bay. Now the Bay is not as ___________________ or as big as it once was. This change has affected plant and animal ________________ as well as recreation for people. We need to solve these ______________________ to save San Francisco Bay.

Answer the following questions.

Is San Francisco Bay the same size today as it was in the past? ____________

What has been dumped along the shores? ______________________________

What is collecting on the bottom of the bay? _________________________

What has lessened the flow of water into the bay? _______________________

Name ______________________________

DIRECTIONS: Here are some ways that man affects his environment. Write 'helps' in front of the sentences that make our environment better. Write 'hurts' in front of the sentences that harm our environment.

____________ 1. Young trees are being planted as old trees are cut down.

____________ 2. Fumes from cars and factories are putting poisons into the air.

____________ 3. Scientists are working to find new ways to kill insects.

____________ 4. Some factories are pouring used, dirty water back into streams and rivers.

____________ 5. Forests are being cut down to make more land for more houses.

____________ 6. City planners are saving open land spaces for parks.

____________ 7. Many people are riding buses or bicycles.

____________ 8. Pesticides are sprayed on crops to kill insects.

____________ 9. Streams and rivers are being restocked with fish.

____________ 10. Litter laws remind people to keep their environment clean.

Name ______________________________

DIRECTIONS: Read the story. At the bottom of the page, underline the best sentence that tells the main idea of each paragraph.

Birds of Prey

(1) America's birds of prey, such as eagles, hawks and owls, are in trouble. Several species are now "endangered". There are three main causes of the trouble.

(2) Pesticides have been sprayed on many of our farm crops. Some of these chemical poisons have passed through nature's food chain and ended up in birds' bodies. This has caused some birds to stop laying eggs. Other birds lay eggs with shells so thin that the eggs break when the parent bird sits on them.

(3) Thoughtless people have also killed many adult birds or destroyed their nests. These people often thought that the birds were pests and that they were eating the crops. But, birds of prey are really the farmers' friends. They eat mice, rabbits, and other small animals that can destroy crops.

(4) People have also destroyed the birds' habitats. They have built houses, factories and highways where the birds live. They have also dug mines, cut forests and plowed the lands where the birds naturally nest and hunt.

Birds of prey are important to the balance of nature. We all need to work together to protect these birds.

Paragraph 1

A. Eagles are birds of prey.

B. Many birds of prey are in trouble.

C. Parrots are an endangered species.

Paragraph 2

A. Some birds lay thin-shelled eggs.

B. DDT is a pesticide.

C. Pesticides are dangerous to birds.

Paragraph 3

A. Many birds are killed by people.

B. Birds eat mice and rabbits.

C. Farmers grow many crops.

Paragraph 4

A. People cut down forests for timber.

B. Birds don't like factories.

C. Many bird habitats have been destroyed by people.

Name ______________________________

Man has polluted his environment in many different ways.

Put numbers in front of each set of sentences to show the order in which they happen.

____ Man began spraying poison on the crops to kill the insects.

1. Insects ate much of man's crops.

____ Poisons also killed birds and other animals that ate the insects.

____ The animals that live in the streams and rivers began to get sick and die.

____ Some factories pour used, dirty water back into the streams and rivers.

____ Factories were built to make more things for people.

____ People made more and more cars.

____ Fumes from cars put poisons into the air.

____ Trees and plants in the cities began to get sick and die.

____ Litter is not nice to look at and can hurt animals.

____ More people made more litter.

____ There are many more people on the earth today.

Name ______________________________

ENDANGERED ANIMALS

Many animals are in danger of becoming extinct. Extinct means that there are not (and never will be) any more of those animals. Dinosaurs are extinct animals.

Animals become endangered for many reasons. Some die because people have moved into places where they live. Then the animals have no place to find food or build their homes. Others are killed for their fur or skins to make coats and other clothing. Some animals are killed because people are afraid of them. Some are killed for sport by hunters.

Here are a few of the animals that are endangered. Draw a line from the animal to the reason you think it might be endangered.

CHEETAH

TIMBER WOLVES

PINE BARRENS TREE FROG

ELEPHANTS

PELICANS

This animal is killed by farmers to protect their herds of cattle and sheep.

People have cut down the trees where this animal makes its home

This animal is hunted for its beautiful fur. The fur is used to make coats.

These animals have been killed by eating poison that farmers spray on crops to kill insects. Fish eat plants that have the poison in them and then these animals eat the fish.

People have moved into places where these animals live. They need a place of their own.

Name ______________________________

Recycling Newspapers

Old newspapers can be recycled. That means they can be used again instead of being thrown away or burned. You should save your old newspapers and take them to a paper mill. Paper mills will pay you money for bringing in old newspapers.

The paper mills have their own ways of making the old newspapers into new paper. They soak the newspaers with water and beat the pulp with paddles. Then the wet pulp is put through heated drying rollers. These rollers squeeze the water out of the pulp and dry it into new paper and cardboard.

When we use paper which has been recycled, we are saving trees. It takes about seventeen trees to make one ton (2,000 pounds) of paper.

DIRECTIONS: Answer the questions.

1. What can you do with old newspapers besides throwing them away, making paper hats, or burning them?

   ____

2. What does recycle mean?

   ____

3. When the paper mills make paper from trees, they use wood chips from trees and cook them with water to make pulp. To make recycled paper, what do the paper mills mix with water to get pulp?

   ____

4. How many trees does it take to make one ton of paper?

   ____

5. What do you think is one of the most important reasons for recycling newspapers?

   ____

Name ____________________

Directions: Read the story. Below the story are some new words. Draw a line from the word to its meaning.

Endangered Animals

Many animals are close to extinction today. There are many reasons why this is so. Some animals have decreased in number for hundreds of years due to changes in climate and vegetation. For example, the giant panda and the whooping crane are both rare probably for these reasons. Other animals such as the North American bison and the tiger are rare because of senseless and destructive hunting. Probably most endangered animals are threatened because of man moving into the places in which they live.

For example, when the first settlers were moving across America's "Wild West", the herds of bison (or buffalo, as they are sometimes called) seemed limitless. There were probably sixty million bison roaming the plains in herds that often had several thousand animals. As the settlers spread across the prairies, the hunters went ahead. Sometimes they were employed to supply meat for workmen on the railroads, but often the slaughter was far greater than was needed. At that time it seemed that the bison would last forever- but by the beginning of this century there were only a few hundred left throughout America. By careful conservation, man has now managed to re-establish several large herds, and in the National Parks of Canada and the U.S.A. these magnificent animals can once more be seen.

decreased
vegetation
rare
senseless
limitless
employed
slaughter
conservation
magnificent

plant life; growing plants
never ending
protecting from loss or being used up
became less
splendid; grand; wonderful
foolish; stupid
unusual, seldom seen or found
give work and pay
killing; butchering

Name ______________________________

Here is a page from TV Guild. Use the page to answer the questions at the bottom of this paper.

TV Guild JUNE 25, 1979

7:30 PM to 9:00 PM

⑦ ⑪ SUPERMAN - Cartoon

⑨ HYDROPONIC GARDENING

Flipper shows how to grow plants in water.

8:00 ③ ④ MOVIE - Science Fiction (BW)

"The Return of the Dinosaurs" A man raises dinosaurs to solve the oil shortage. (1 hr.)

⑤ AS THE WORLD TURNS GRAY - Serial

⑦ ⑪ HAPPY DAYS

Fonzie grows moss on his motorcycle.

8:30 ⑤ ⑩ WOODSY THE OWL - Cartoon

⑦⑪ ⑬ STAR TREK

Captain Kirk searches for a new, clean planet.

⑨ WHERE DOES ALL THE GARBAGE GO

A visit to a company who is turning garbage into electricity.

9:00 ② ④ ⑤ NEWS

⑦ ⑪ RANGER RICK

The ranger talks about the good and bad parts of forest fires.

1. Write the names of the cartoon programs. ____________________
____
2. At what time can you see the NEWS on three channels? ____________
3. When is the program on HYDROPONIC GARDENTING shown? ____________
4. What kind of a program is AS THE WORLD TURNS GRAY? ____________
5. Are these programs shown in the day or night time? ____________

Name ______________________________

RUMBLE
ROAR
SCREECH
BOOM
BARK

Noise pollution is a serious problem. Sometimes it is hard to hear people talk and, sometimes, even to think because of the noise around us. Loud noises can give people stomach aches and headaches, make their hearts beat faster and even make them tired and angry. Very loud noises can hurt your hears and cause permanent loss of hearing.

We are surrounded by noise every day. Jet planes, honking automobiles, barking dogs, TVs, dishwashers and other machines all add to the noises we hear.

People are trying to fight noise pollution. In 1972 the United States Congress passed the Noise Control Act. This law says that the government must try to get rid of noise whenever it can.

We can do something about noise too. We can try not to shout or yell when we talk. We can turn off TVs and radios when no one is listening. Draperies and carpets help to cut down the noise level. The thick materials absorb the sound so some of it does not reach your ear. We can also try to use fewer machines. Everyone can help solve the noise pollution problem.

Read the story to complete the sentences.

1. Very loud noises can cause permanent loss of ______________________.
2. In 1972 Congress passed the ______________________________________.
3. We should turn off TVs and radios when no one is __________________.
4. Thick materials, like carpets and drapes, absorb __________________.
5. People are trying to fight ______________ ______________________.

Name ____________________

Doyle School
10740 Wunderlich Ave.
Cupertino, CA 95014

Sept. 18, 1979

National Wildlife Federation
1412 16th St., N.W.
Washington, DC 20036

Dear Mr. Smith,

Last Tues. our class was talking about building a wildlife habitat in part of our school playground. We understand that you have a Backyard Wildlife Program which will provide directions. Please send us the information we will need.

Thank you,

The students in Rm. 15

Write the words that have been abbreviated in the letter.

Ave. ____________________

Sept. ____________________

Mr. ____________________

Rm. ____________________

CA ____________________

St. ____________________

Tues. ____________________

* N.W. ____________________

Name ______________________________

We know that a 'habitat' is a place where plants and animals naturally live and grow. Every plant and animal has its own special habitat which provides food, water, and shelter.

These habitats are part of even larger areas called 'biomes'. Each biome has a special climate, type of soil, and living conditions which provide habitats for certain plants and animals.

The forest is one biome. Evergreen trees, such as firs, spruce, and pines grow in the forest biome. Animals, like deer, bear, and squirrels, are found here.

The desert is another biome. Lizards, tortoises, and some snakes make their home in this biome. Plants, like the cactus, grow well in the desert.

Other biomes include the grassland, cliffs, ocean, tropical forest, and tundra.

The plants and animals below have been listed in the biome where their habitats are usually found. There is one mistake in each list. Cross out the name of the plant or animal whose habitat is not usually found in that biome.

DESERT BIOME

1. Tortoise
2. Cactus
3. Polar bear
4. Camel

OCEAN BIOME

1. Whale
2. Cow
3. Seaweed
4. Eel

TUNDRA BIOME

1. Penguin
2. Seal
3. Reindeer
4. Tiger

GRASSLAND BIOME

1. Dolphin
2. Rabbit
3. Blackbird
4. Rattlesnake

NORTH
SOUTH
EAST
WEST
?

Name ____________________

DIRECTIONS:

Write Yes in front of each group of words that is a sentence.
Write No in front of each group of words that is not a sentence.

_______ 1. It takes a lot of energy to make the products we buy.

_______ 2. Three ways to conserve energy.

_______ 3. You should buy things that will last a long time.

_______ 4. We don't want to waste the energy that is needed to make products.

_______ 5. Buying soda in returnable bottles rather than disposable or throw-away bottles.

_______ 6. Recycled paper is good to buy.

_______ 7. We all know that the best way to save energy.

_______ 8. Extra packaging, such as bulky containers, double boxes and unnecessary plastic.

_______ 9. It is wasteful to throw away extra packaging materials.

_______ 10. Try to choose things that come in containers you can use again.

Name ______________________________

DIRECTIONS: Solve the riddle by answering the questions correctly.

RIDDLE: If April showers bring May flowers, what do May flowers bring?

____ If hydroponic gardening means growing plants in water, put a P on the line. If not, put a N.

____ If polluted air can kill trees and other plants, put I. If not, put O.

____ If the wood from trees is used to make glass, put T. If not, put L.

____ If trees and plants help to clean the air, put G. If not, put R.

____ If conservation means you should never cut down a tree, put I. If not, put R.

____ If plants can prevent soil erosion, put I. If not, put G.

____ If people could live without plants, put H. If not, put M.

____ If plants need water and light to grow, put S. If not, put T.

Name

DIRECTIONS: Complete the sentences. Use the letters of the answers to solve the riddle.

1. A Greek word meaning water is H Y D R O.
   5 12 9 13 11

2. Some gardeners grow plants in just
   14 4 10 2 13.

3. Liquid food and vitamins are added to help the plants
   15 13 11 14.

4. Bits of charcoal will help to keep the water
   3 6 2 4 13.

5. Sometimes pebbles, moss or vermiculite is used to hold the
   13 11 11 10 16.

6. This kind of gardening saves water because none is
   14 4 16 10 2 9.

7. This method works well for people who have small
   1 4 3 8
   17 4 13 9 16.

8. We call this hydroponic
   15 4 13 9 2 18 7 18 15.

WHY DID SANTA CLAUS ALWAYS HAVE A GARDEN?

1 2 3 4 U 16 2   5 2   6 7 8 2 9   10 11

5 11, 5 11, 5 11!

Name ______________________________

DIRECTIONS: Read the story. Draw a line from the words below to the right meaning.

City Climate

It is usually hotter in the city than in the country. Do you know why?

In large cities, many machines are used to make, move, heat, or cool things. As these machines use energy, they give off a lot of waste heat. The cities become warmer than the countryside where there are fewer machines.

Also, when people build cities, they replace forests and fields with concrete and asphalt. Concrete and asphalt sidewalks absorb more sunlight and heat than forests and fields do. The sidewalks and buildings give off this heat day and night.

These are the two main reasons why the city is usually warmer than the country.

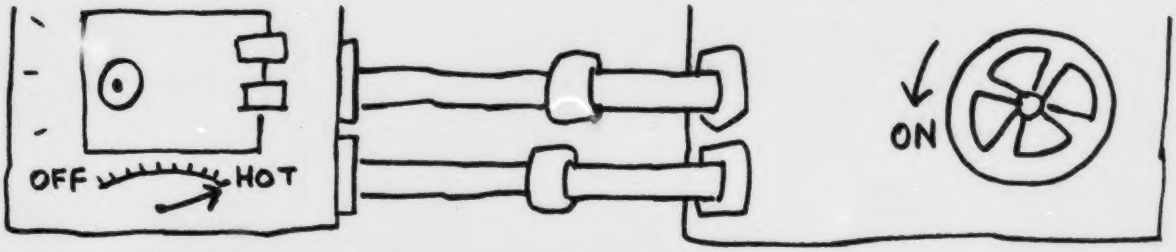
asphalt	the kind of weather a place has
absorb	invented by man to make work easier
machines	used for sidewalks, roofs and roads
forests	take in and hold
climate	left over, not used
waste	large area of land covered with trees

Name ______________________________

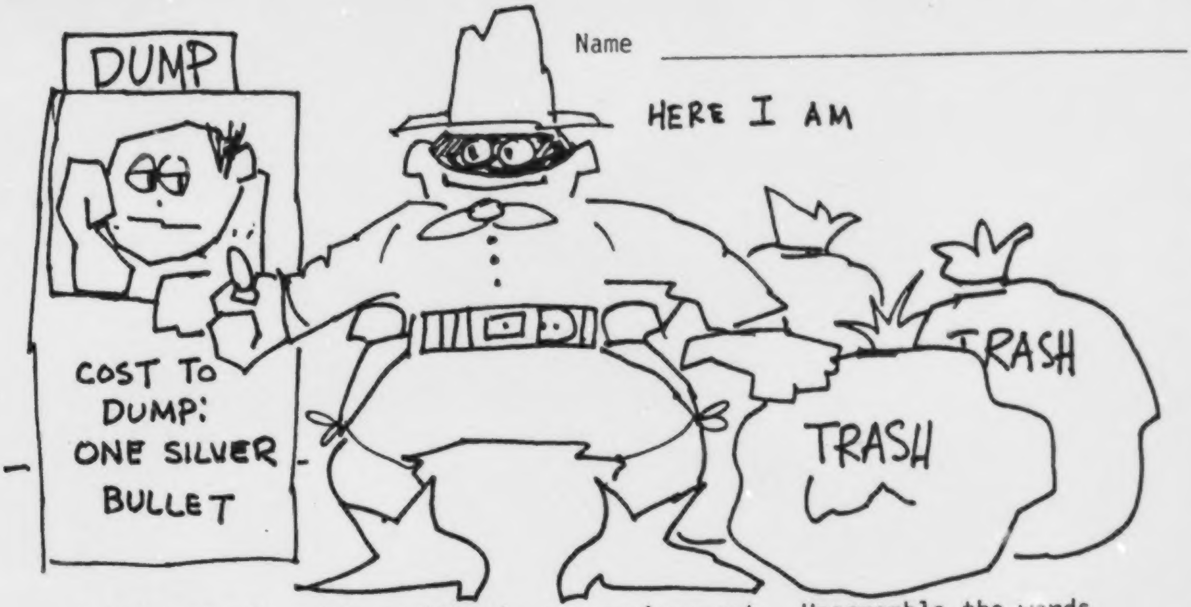
DIRECTIONS: There is a misspelled word in each sentence below. Circle the word that is spelled incorrectly. Write it correctly on the line at the right of each sentence.

REFUSE-ENERGY SYSTEMS

1. Solid waste can become a valuible fuel. ______________________
2. One garbidge can of solid waste has the fuel energy of one gallon of gasoline. ______________________
3. We can use solid waste as a substatute for coal and oil fuels. ______________________
4. The waste materials can be burned in huge furnuses. ______________________
5. The smoke from the burning can be cleaned so that there will be no air polution. ______________________
6. The heet from the fire will boil water to create steam. ______________________
7. The steam will be pipped to nearby power plants to turn large turbines. ______________________
8. The turbines will run the generators which produce ellectricity. ______________________
9. This is called a refuse-energy sistem. ______________________
10. This method can provide energy and help to get rid of our waste materiuls. ______________________



Name ______________________________


DUMP
HERE I AM
COST TO DUMP: ONE SILVER BULLET
TRASH
TRASH

Solid waste is a big problem in our environment. Unscramble the words to complete each sentence. Write the words on the spaces.

1. Solid waste is another word for BARGGEA. ___ ___ ___ ___ ___ ___ 5

2. Sometimes solid waste is piled in open SPUMD. 2 8 7 4 ___

3. Another word for waste materials is SARHT. 1 ___ ___ ___ 3

4. Getting rid of solid waste is called POSDALIS. 2 ___ ___ 4 6 ___ ___ ___

5. Some companies are burning garbage to make GYEERN. 5 ___ 5 ___ ___ ___

Use the letters in the numbered spaces to find out:

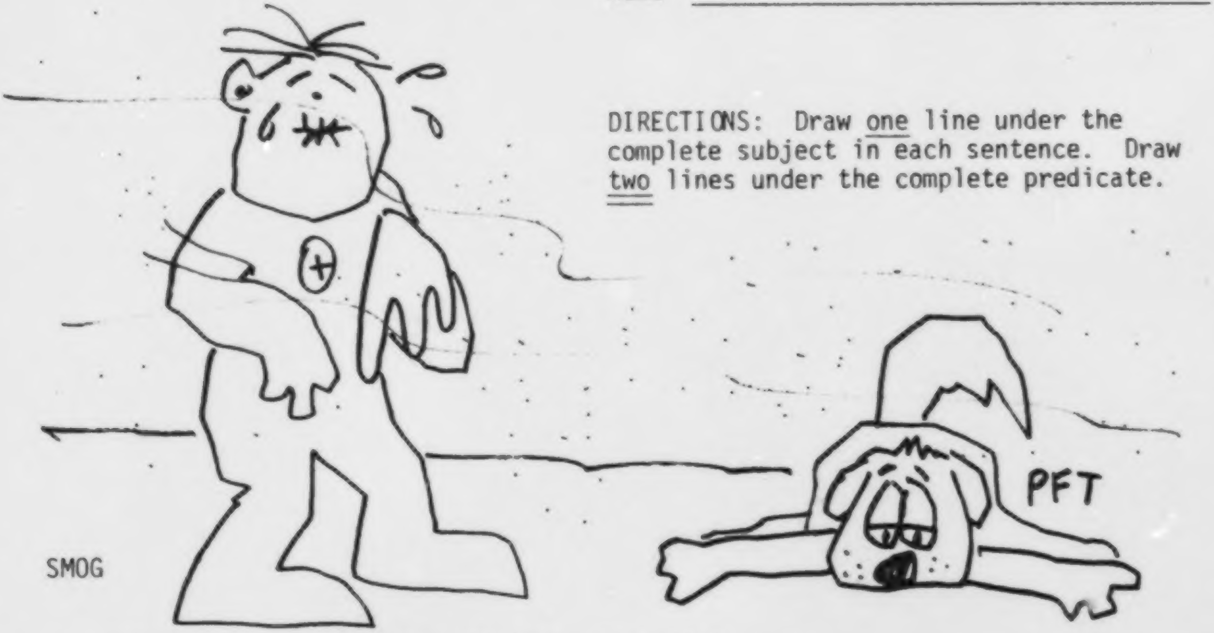
"Where does the Lone Ranger take his trash?"

1 6 1 3 5 2 8 7 4, 1 6 1 3 5 2 8 7 4,

1 6 1 3 5 2 8 7 4, 2 8 7 4, 2 8 7 4 . . . .

(If you don't know this tune, ask your teacher.)

Name ______________________________



DIRECTIONS: Draw one line under the complete subject in each sentence. Draw two lines under the complete predicate.

1. Air that is heavy with pollutants is called smog.

2. Smog is a combination of dust and gases that mix with the air.

3. Blowing soil, ocean sprays, volcanic activity, forest fires, automobile exhaust and industrial factories are all causes of smog.

4. In cities, where there are more factories and automobiles, the amount of smog is greater.

5. Smog can hurt your eyes, make you cough, and give you headaches.

6. Animals and plants are affected by smog, too.

7. Many cities are trying to clean their air.

8. Blower fans, filters and water sprays are used by some factories.

9. The factories are trying to lower the amount of dust that escapes into the air.

10. We all need clean air to live.

Name ______________________________

DIRECTIONS: Fill in the circle in front of the word that best completes the sentences.

0 walks
1. They are 0 walked to school to save gasoline.
0 walking

0 turns
2. He 0 turned out lights when they are not needed.
0 turning

0 saves
3. Last year he 0 saved ten pounds of newspapers to recycle.
0 saving

0 wastes
4. They are 0 wasted water by letting the faucet drip.
0 wasting

0 shines
5. The sun 0 shined on the earth and gives us solar energy.
0 shining

0 picks
6. The students in Mrs. Peterson's class are 0 picked up papers on the yard.
0 picking

0 kills
7. Man has 0 killed many animals for their fur and skins.
0 killing

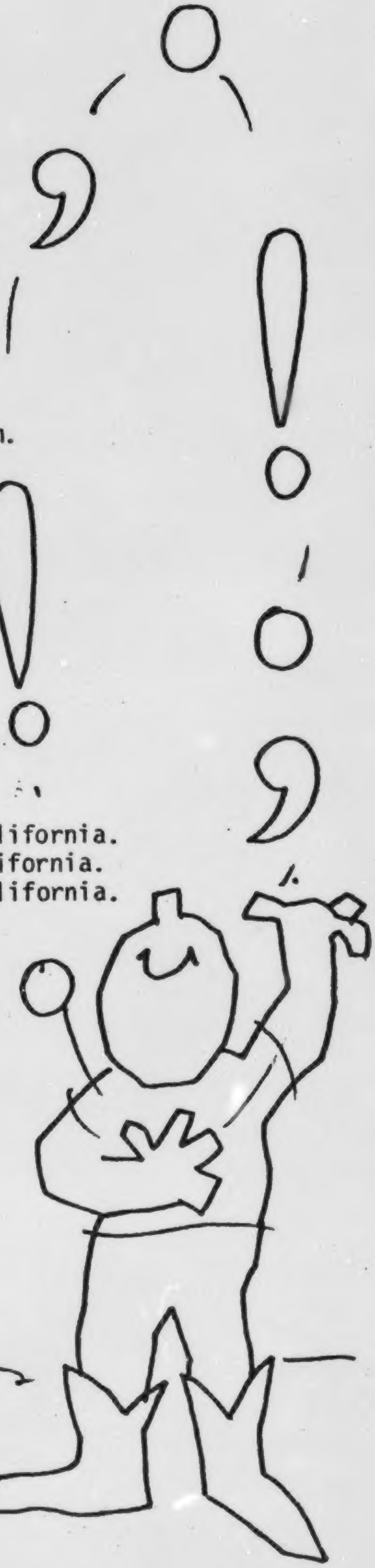
0 plants
8. We 0 planted trees in our yard to give us shade in the summer.
0 planting

0 makes
9. Smog 0 maked it hard for plants to grow.
0 making

0 uses
10. Hydro power is 0 used water to make energy.
0 using

Name ______________________

Punctuation ! Fill in the correct circles.



○ wont
1. She ○ won't throw papers on the ground.
○ wo'nt

○ litterbug,
2. Are you a ○ litterbug.
○ litterbug?

○ Mrs
3. ○ Mrs. Jones is saving her newspapers to recycle them.
○ mrs

○ Woodsy's
4. Do you know ○ Woodsys' song about pollution?
○ Woodsys

○ bottles,
5. We save used ○ bottles. and cans.
○ bottles

○ Cupertino. California.
6. There are many recycling centers in ○ Cupertino California.
○ Cupertino, California.

○ sun,
7. All plants and animals need ○ sun air, and water.
○ sun.

○ natural resources,
8. We need to save our ○ natural resources.
○ natural resources

○ Stop!
9. ○ Stop, Don't waste that paper.
○ Stop

○ again!
10. Using things ○ again, can save you money.
○ again

Name ______________________________

DIRECTIONS: Draw a line under the words in each sentence that should begin with capital letters.

1. john and i went on a field trip last thursday.

2. our class went to the leslie salt company.

3. it is located along the shores of san mateo county.

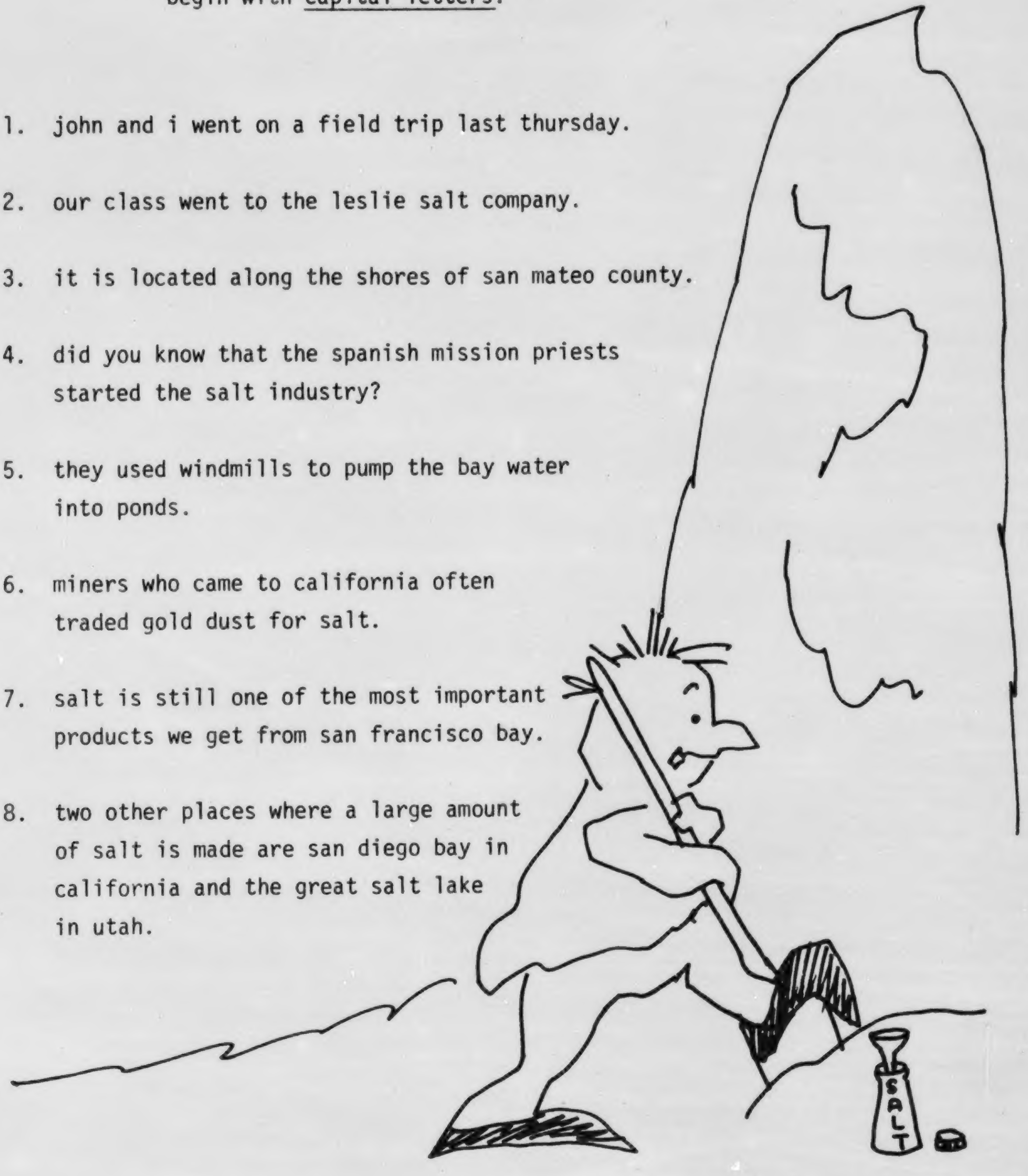
4. did you know that the spanish mission priests started the salt industry?

5. they used windmills to pump the bay water into ponds.

6. miners who came to california often traded gold dust for salt.

7. salt is still one of the most important products we get from san francisco bay.

8. two other places where a large amount of salt is made are san diego bay in california and the great salt lake in utah.



Name ______________________________

How Many Syllables?

Put these ecology words in the correct row.

smoke smog dust plastic animals paper
energy pollution litter trees garbage water
recycled habitat air

One syllable	Two syllables	Three syllables

Name ____________________

DIRECTIONS: Complete the sentence with the correct word.

1. There ______________ many kinds of pollution.
(is) (are)

2. Noise ______________ one kind of pollution.
(is) (are)

3. Loud radios, TVs, and vacuum cleaners ______________ things that can cause noise pollution in the home.
(is) (are)

4. Water, air, and land ______________ being polluted too.
(is) (are)

5. Car exhaust and factories ______________ the biggest cause of air Pollution.
(is) (are)

6. Our water ______________ being polluted with sewage and detergents.
(is) (are)

7. Chemicals and pesticides ______________ other causes of water pollution.
(is) (are)

8. Land ______________ being polluted with garbage and other solid wastes.
(is) (are)

9. When people leave waste and garbage on the ground, it ______________ called litter.
(is) (are)

10. Smog ______________ a kind of air pollution.
(is) (are)

11. Keeping our land clean ______________ a job for everybody.
(is) (are)

12. Pollution ______________ not very nice to see or smell.
(is) (are)

Name ______________________________

Find the contraction in each sentence and draw a line under it. Write the contraction and its meaning on the spaces.

1. People shouldn't put nails in trees.

____________________ ____________ ________

2. It's not safe to drink polluted water.

____________ ________ ________

3. Solar energy doesn't cost a lot to use.

______________________ ___________ __________

4. Endangered animals means there aren't many left.

____________________ __________ ________

5. Dumping waste into the water isn't a good idea.

___________________ ______ __________

6. When we litter, we're polluting the earth.

________________ ________ __________

7. We couldn't live without water.

_________________________ ______________ _______

8. Plastic can't be melted down and used again.

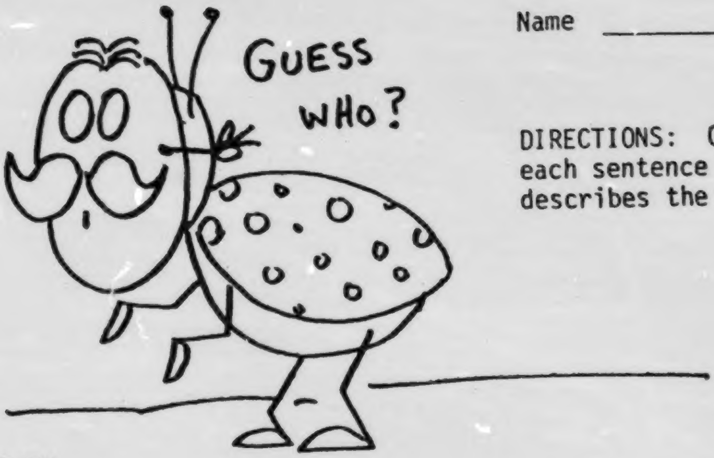
__________________ ________ _________

9. They're saving cans to recycle.

____________________ ___________ ________

10. There wasn't as much pollution 50 years ago.

_______________________ __________ ________



Name ____________________

DIRECTIONS: On the line at the right of each sentence write the adjective that describes the underlined noun.

ADAPTATION

1. The living things that have the greatest chance of survival are the ones that can adapt themselves to their surroundings. ____________________
2. Some plants and animals change their color, body structure, or food habits to survive. ____________________
3. These changes happen over a long period of time. ____________________
4. The cactus is a good example of a plant that has adapted to changing temperatures. ____________________
5. It can hold large amounts of water for a long time. ____________________
6. This is why it can live in the hot desert where water is scarce. ____________________
7. Moths that live in smoggy cities have been known to change their color from white to grey. ____________________
8. This color change helps them to better hide from their enemies. ____________________
9. Some animals have developed longer legs for running, sharper claws for digging, or the ability to change colors. ____________________
10. You are adaptable if you can change when various things around you change. ____________________

Name ______________________________

DIRECTIONS: Draw a line under the compound words you find in the story. Write them on the blank spaces below. Draw a line between the two words that form the compound word.

Many people are working hard to help our environment. They are asking our Congressmen to pass laws to protect our wildlife and prevent pollution.

You may know that you can go to jail or pay a fine if you litter our highways. There are also laws against making too much noise and polluting your neighbor. We have laws requiring licenses for fishing and hunting. The money from these license fees is sometimes used to restock rivers and lakes with fish, to replant trees and shrubs along the roadsides, and to make improvements in parks and campgrounds. Laws also limit lumber companies in the amount of redwood trees that they can cut.

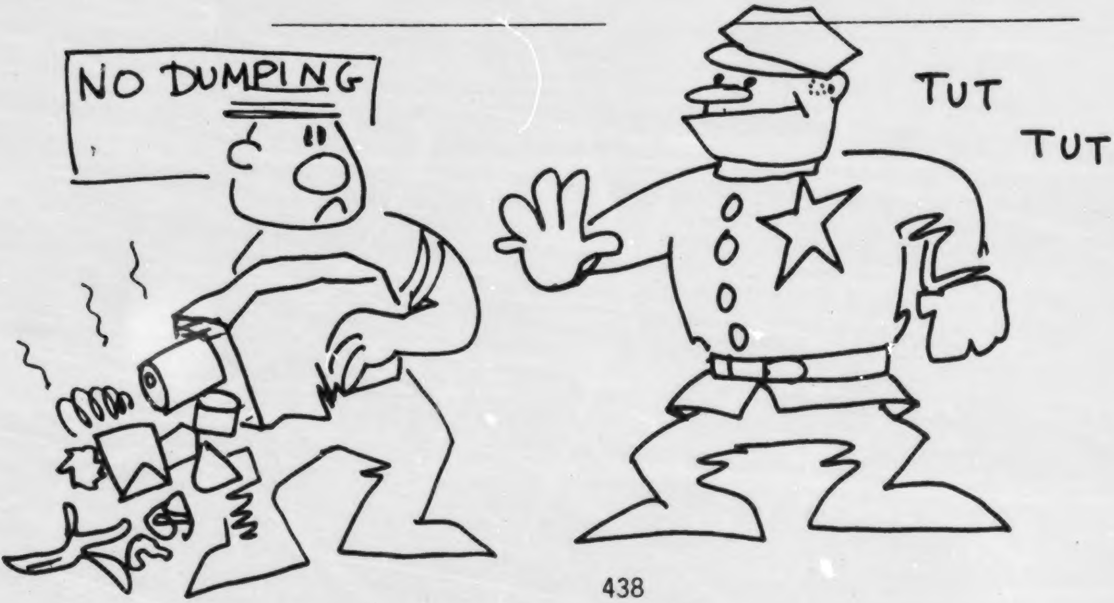
Taking care of our environment is a responsibility for everyone.

____________________ ____________________

____________________ ____________________

____________________ ____________________

____________________ ____________________



Name ______________________________

DIRECTIONS: Correct the story by drawing a circle around the right homonym.

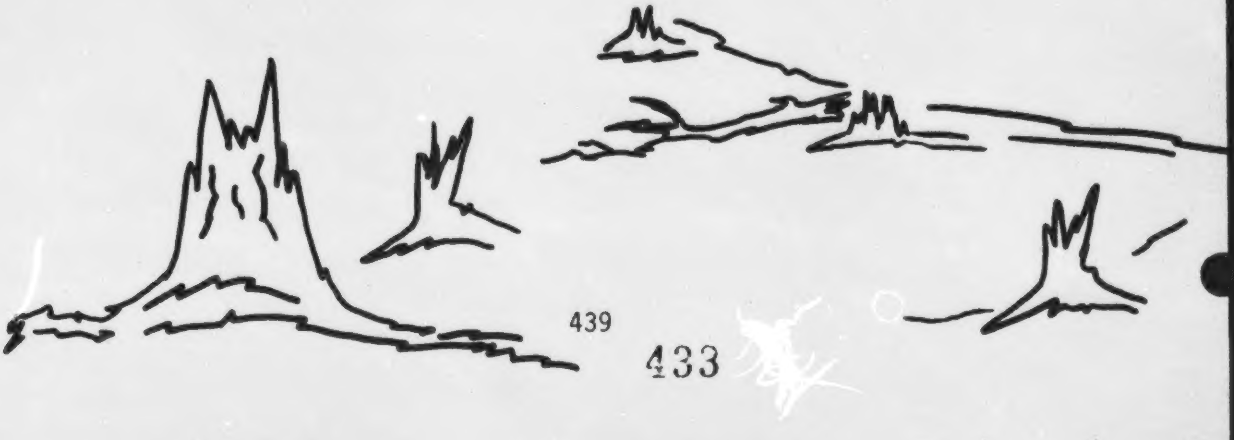
OUR FOREST

When the first settlers came to America, forests covered (too, two) thirds of the land. The settlers cut down the trees to make room for (their, they're) farms. They used the (would, wood) to build houses and to burn for fuel.

Soon loggers and farmers were cutting down (hole, whole) forests. They often "clear cut" areas of land. This means they used big machines to knock down all the trees. When they were (threw, through), the land was (bare, bear).

(Some, Sum) people said, "We (no, know) there will always be more trees." But, they were wrong. Other people began to worry about (our, hour) forests. They (new, knew) that clear cutting of forests could cause floods and destroyed the homes of animals. They helped to get laws passed to protect our forests.

Conserving a forest does (knot, not) mean leaving the trees alone, for the forest is a living, renewable resource. It means protecting the forest and using it wisely.



Name ______________________________

DIRECTIONS: Synonyms are words that have the same, or almost the same, meaning.

Use the words below to complete the sentences. Choose the word that has almost the same meaning as the word in parentheses ( ).

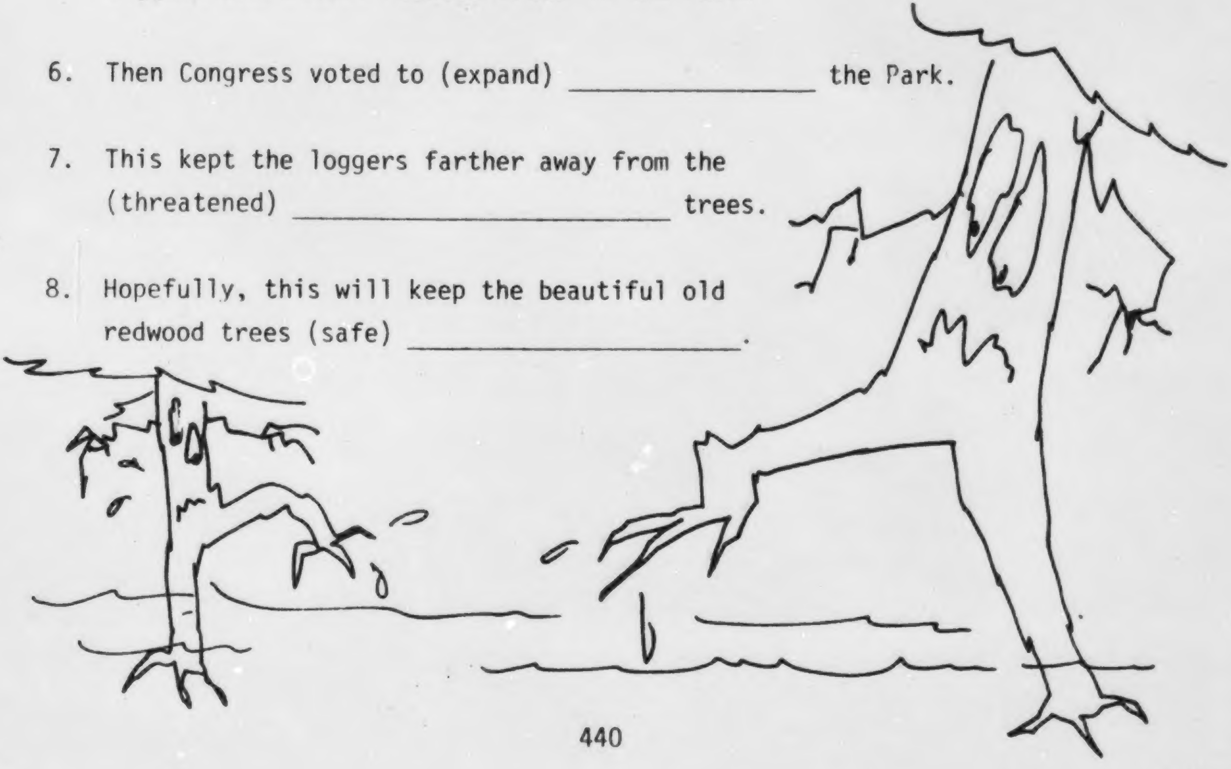
enlarge
overflow

damage
distress

endangered
stripping

protected
soil

1. The trees in Redwood National Park were in (trouble) ____________________.
2. Lumber companies were (clearcutting) ____________________ trees from the lands next to the Park.
3. When it rained, (dirt) _____________ ran off the treeless land and into the Park.
4. The rainwater caused Redwood Creek to (run over) ____________________ its banks.
5. The flood water began to (hurt) ___________________ the roots of the biggest and oldest redwood trees in the Park.
6. Then Congress voted to (expand) ________________ the Park.
7. This kept the loggers farther away from the (threatened) __________________________ trees.
8. Hopefully, this will keep the beautiful old redwood trees (safe) _______________________.



ACROSS

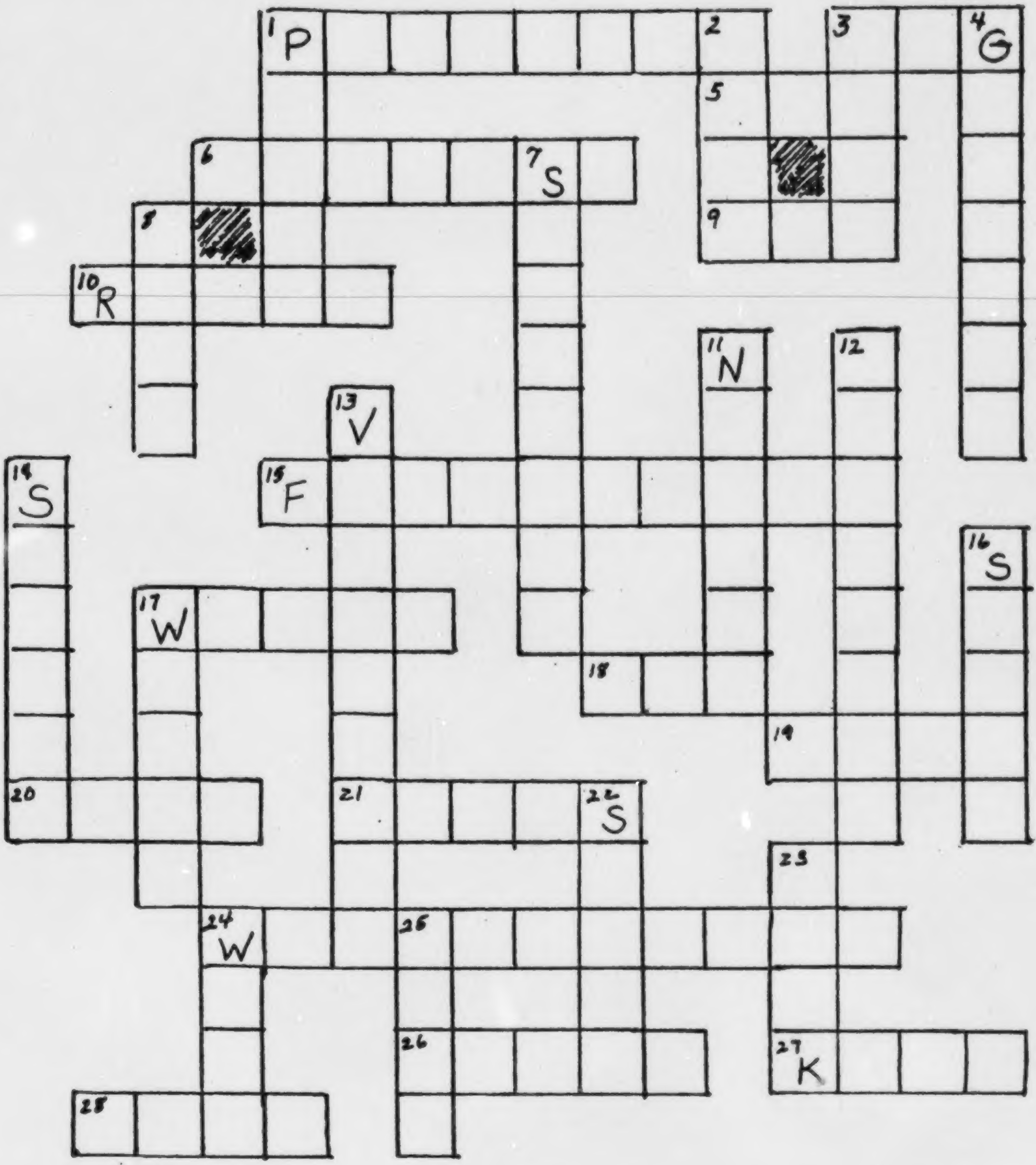
1. -------- are good mashed, baked, or fried.
3. A --- is an insect.
5. A potato has ---s, but cannot see.
6. In autumn it's ------- time.
9. --- a deep hole to plant a tree.
10. Plants absorb water through -----.
15. ---------- is plant food.
17. All plants need -----.
18. A garden tool with a thin, flat blade
19. A plant not wanted in the garden
20. Singular of leaves
21. Limas and pintos are -----.
24. A small garden cart is a -----------.
26. A piece of wood driven into ground to support plants
27. Frost will ---- many plants.
28. A tool used to gather leaves

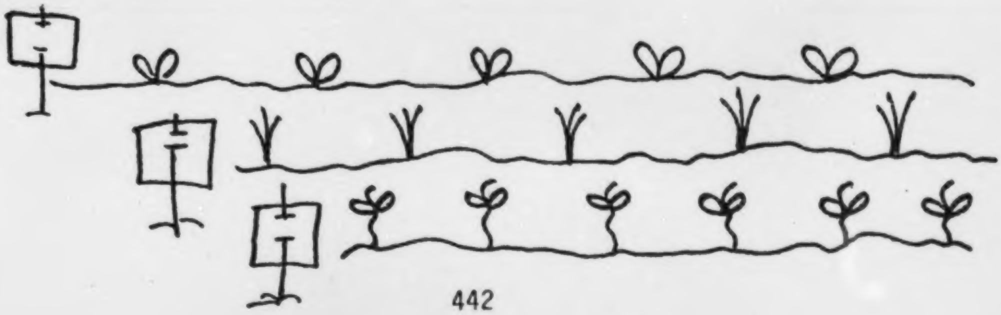
DOWN

1. ----- vegetables in spring.
2. Most plants grow in ----.
3. Ice---- lettuce
4. When plants are getting bigger, they are -------.
7. Warmth from -------- helps plants grow.
8. We use a ---- to water the garden.
11. The ------ is a spout at the end of a hose.
12. A person who gardens
13. A plant we eat is called a ---------.
14. A digging tool
16. Another type of digging tool
17. Flour comes from -----.
22. Corn grows on a tall -----.
23. Knife, ----, and spoon
24. Gardening is hard ----, but it's fun.
25. The sun rises in the ----.

Name ____________________

GROWING A GARDEN - 2


1 P
2
3
4 G
5
6
7 S
8
9
10 R
11 N
12
13 V
14 S
15 F
16 S
17 W
18
19
20
21
22 S
23
24 W
25
26
27 K
28



Name ________________________________

DIRECTIONS: Underline the best word to complete the sentence.
Circle those words in the 'word find'.

1. The Golden Gate Bridge spans the entrance to
Monterey
San Francisco
Bay.

2. The wet, grassy area around the Bay is called the
marshland.
channel.

3. An important product we get from the Bay is
tuna.
salt.

4. Boating and fishing are types of Bay
recreation.
habitats.

5. Many
bears
birds
make their homes in the marshlands around the Bay.

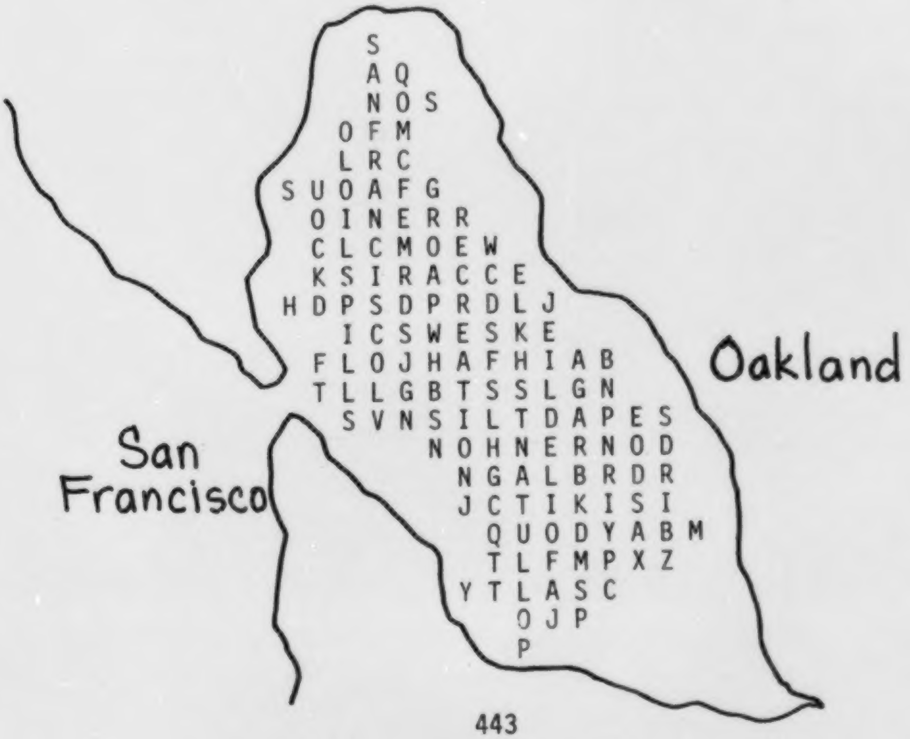
6. Very fine dirt which is carried by rivers and filling the Bay is
silt.
salt.

7. Chemicals and sewage are
spiders
pollutants
that are harming the Bay.

8. Garbage is an example of
solid waste
a good thing
that is sometimes dumped in the Bay.

9. Sea otters
Oil spills
are another problem of the Bay.

10. We should all work to keep San Francisco Bay
clean.
wet.


S
A Q
N O S
O F M
L R C
S U O A F G
O I N E R R
C L C M O E W
K S I R A C C E
H D P S D P R L J
I C S W E S K E
F L O J H A F H I A B
T L L G B T S S L G N
S V N S I L T D A P E S
N O H N E R N O D
N G A L B R D R
J C T I K I S I
Q U O D Y A B M
T L F M P X Z
Y T L A S C
O J P
P
Oakland
San Francisco

Name ______________________________

DIRECTIONS: Read the story. Find the words below in the story and draw a line under them. Write the words in alphabetical order on the spaces below the story.

disappear crocodiles species entire

pandas extinct destruction people

societies continue

Disappearing Animals

Animals are always changing. Just as new ones appear, so others disappear. Some, like the crocodile, have remained the same for millions of years, while others are changing rapidly. In the last few hundred years, man has spread out over the whole world. In doing so, he has killed millions of animals. Some have been killed for food, some because they were pests, some for sport, and some for their furs.

Man has also wiped out entire species of animals. Once a species is extinct, there will never be any more.

More and more people are becoming aware of this and are trying to stop the destruction of wildlife. Societies like the World Wildlife Fund buy reservations where animals can live in peace. Governments protect animals so that their people can enjoy seeing them. Wild animals should be for everyone, not just for a few hunters.

If we want to continue to see leopards, tigers, pandas, crocodiles and other animals, we must make sure that they do not become extinct.

1. ______________________________

2. ______________________________

3. ______________________________

4. ______________________________

5. ______________________________

6. ______________________________

7. ______________________________

8. ______________________________

9. ______________________________

10. ______________________________

Name ______________________________

DIRECTIONS: We often use similies to explain events or describe people and feelings. Beneath each simile below, draw a line under the sentence that best explains what is meant.

1. When the fire broke out, Russ was 'as brave as a lion'.
   - A. He was very courageous when the fire started.
   - B. When the fire started, he crawled away.
2. Carolyn and June are 'up to some monkey business'.
   - A. They are starting to sell monkeys.
   - B. They are doing something foolish.
3. Janice was 'as busy as a beaver'.
   - A. She was building a dam on a river.
   - B. She was working very hard.
4. Before the party started, Ed 'let the cat out of the bag'.
   - A. He told something that was a secret.
   - B. He released the cat from the sack.
5. Boy, is that a 'fishy' story!
   - A. The story is about fishing.
   - B. The story sounds untrue.
6. You should have seen Gail's 'crocodile tears' when she got scolded.
   - A. Her crocodile was sobbing too.
   - B. She was crying big tears.
7. That new boy, Carlton, is 'as wise as an owl'.
   - A. He knows how to catch birds at nighttime.
   - B. He is very smart.

These are just a few of the many similes we use that are about animals. Are these true characteristics? What about 'slippery as an eel', 'dumb bunny', or 'cute as a bug'?

Name ______________________________

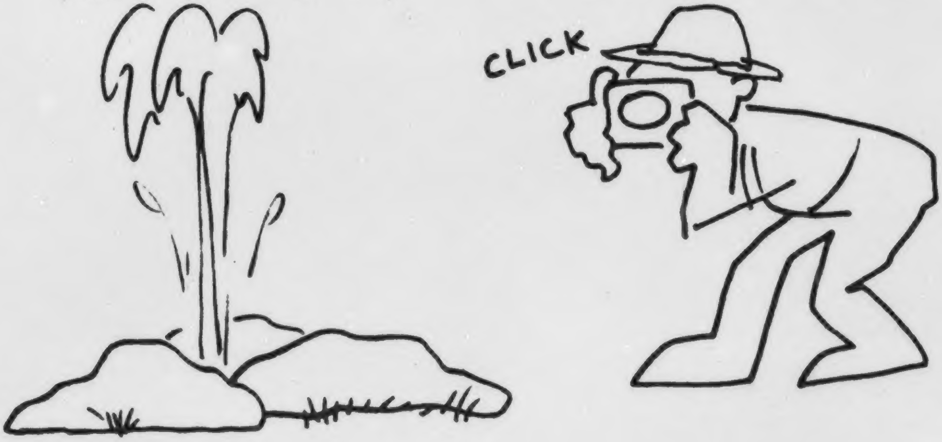
DIRECTIONS: Read the following story. Draw a circle around the correct verbs.

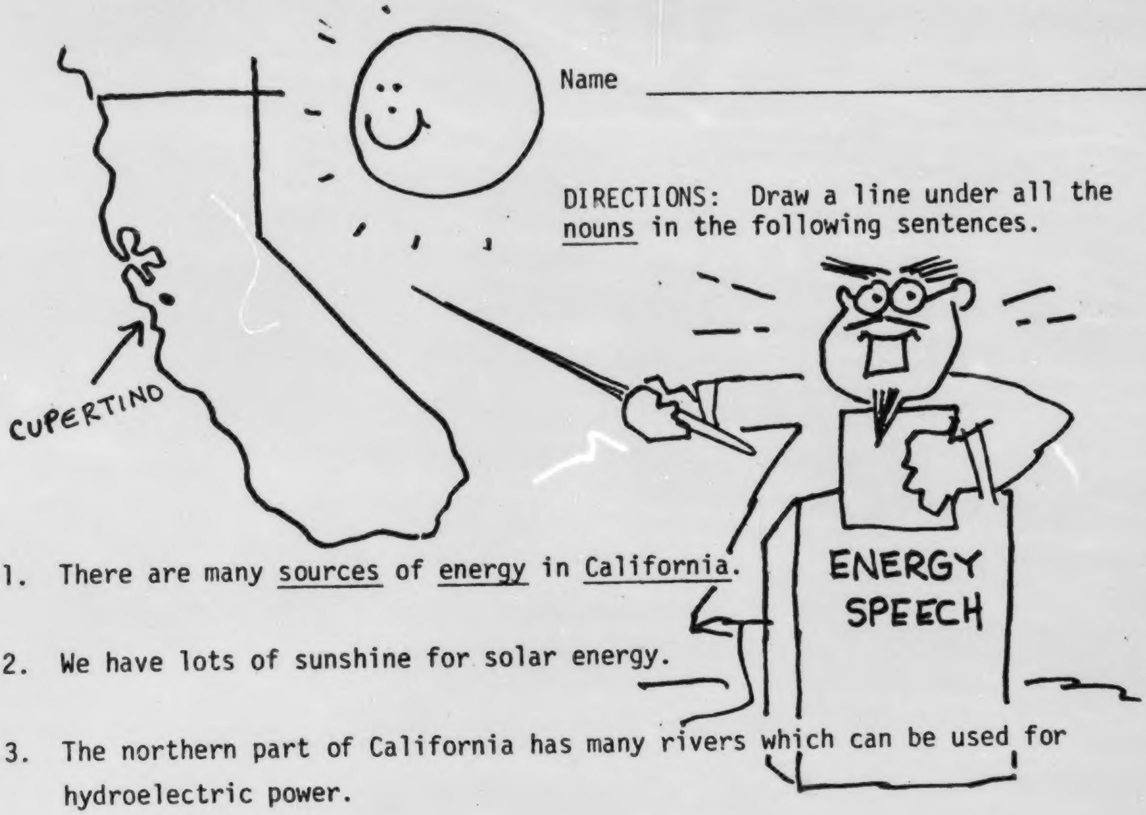
Geothermal Energy

The center of the earth (is are) made up of very hot liquid rock. Sometimes some of it (rise rises) near the earth's surface. It (made makes) the underground water boil. When this hot water or steam (come comes) up through a crack in the earth, we (call calls) it a "geyser."

Sometimes the steam of the geyser is (carry carried) directly by pipes into buildings. In other cases it (is are) used to generate electricity. When the steam (is are) used to generate electricity, it (is are) called geothermal energy.

Many people (like likes) geothermal energy because it (don't doesn't) pollute the air. At the present time it (is are) usually too expensive and hard to use. We still (had have) lots to find out about using geothermal energy.





Name ______________________________

DIRECTIONS: Draw a line under all the nouns in the following sentences.

1. There are many sources of energy in California.

2. We have lots of sunshine for solar energy.

3. The northern part of California has many rivers which can be used for hydroelectric power.

4. The southern part of California has many oil fields.

5. The land near Mt. Lassen has many hot springs.

6. This volcanic area produces geothermal power.

7. Even windmills are used for power in California.

8. We have several nuclear power plants in this state, too.

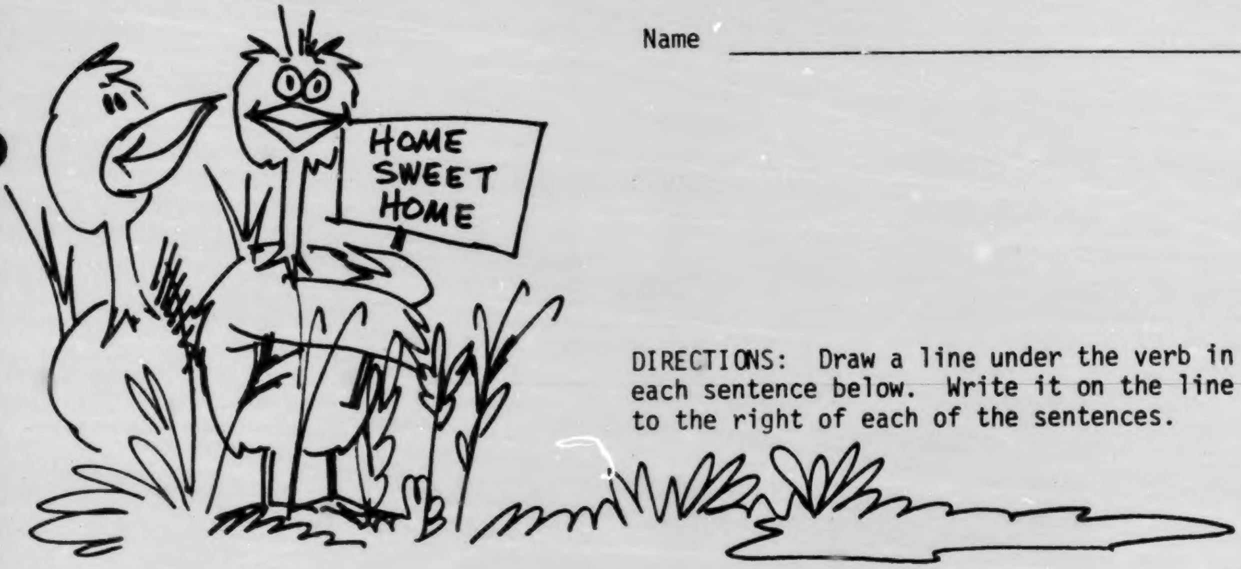
9. California also has more people than any other state.

10. All these people need and use a lot of energy.

Write the two proper nouns that are in sentences on these lines.

______________________________ ______________________________

Name ______________________________



DIRECTIONS: Draw a line under the verb in each sentence below. Write it on the line to the right of each of the sentences.

THE MARSHLAND

1. The bay marshes furnish habitats for fish, plants, and other wildlife. ________________

2. The Suisun Marsh is the largest wetland around San Francisco Bay. ________________

3. It contains 85,000 acres of tidal marshland. ________________

4. This totals more than 10% of California's remaining wetland area. ________________

5. The marshlands provide an important resting place, feeding area, and wintering ground for migrating birds. ________________

6. Hundreds of thousand of birds live in the marshlands around the Bay. ________________

7. Many rare and endangered species make their home in the marshlands. ________________

8. Life in the marshlands depends on clean water. ________________

Name ______________________________

DIRECTIONS:

Sam is planning ways to save energy.

Draw a line through the ideas that are silly or foolish.

Conservation Class

Sam Spade
May 1, 1980

My Ways to Save Energy

1. I will use both sides of my writing paper.
2. I will stop eating spinach.
3. I will turn off the TV when I'm not watching it.
4. I will use paper plates and cups instead of ones that need to be washed.
5. I will dig an oil well in my back yard.
6. I will turn out the lights when I leave the room.
7. I will never wash my face again.
8. I will walk or ride my bike instead of asking my Mom to drive me.
9. I won't stand with the refrigerator door open while I decide what I want to take out.
10. I will turn the water off while I'm brushing my teeth.
11. I won't waste my energy to do my homework.
12. I will save things that can be recycled.

Name ______________________________

DIRECTIONS: Arrange each group of numbers in order (smallest to largest) to read the message.

52	87	60	2	16	99	8	37	63	21	11	29	79	46	58	81
E	I	A	T	E	L	R	A	N	S	E	W	D	T	R	O

Write the numbers on the line. Write the letter that goes with it underneath.

2 _ _ _ _, _ _ _ _ _ _ _ _ _ _ _

T

162	196	170	100	119	193	180	179	182	105	155	112
R	S	S	A	N	E	U	O	C	R	L	E

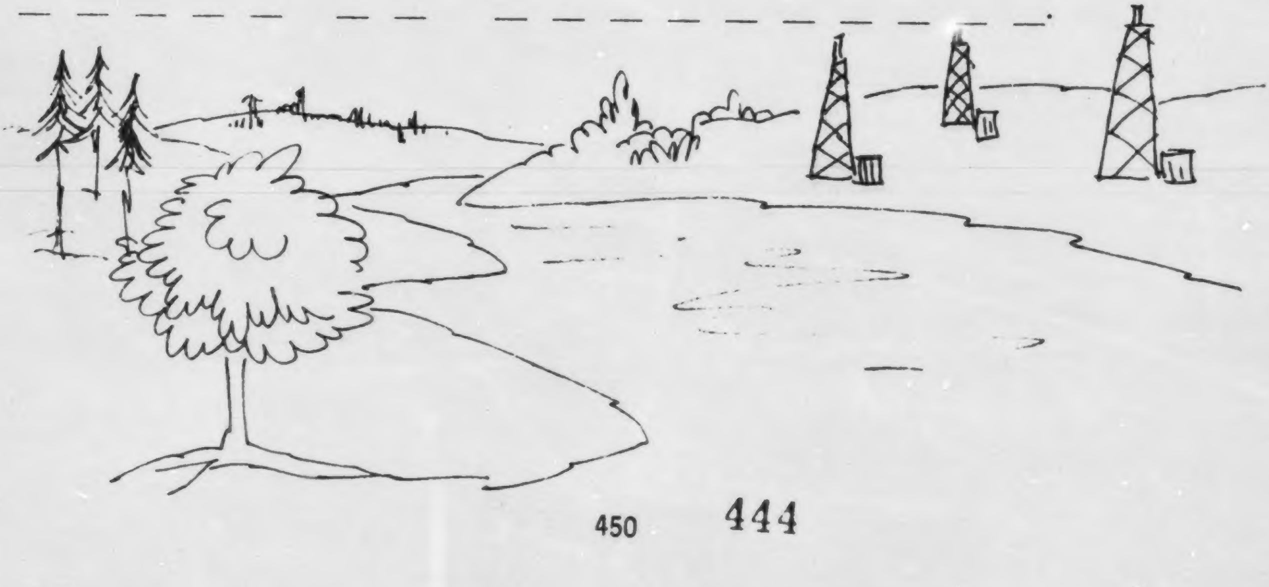
143	167	126	139	138	150
R	E	A	U	T	A

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

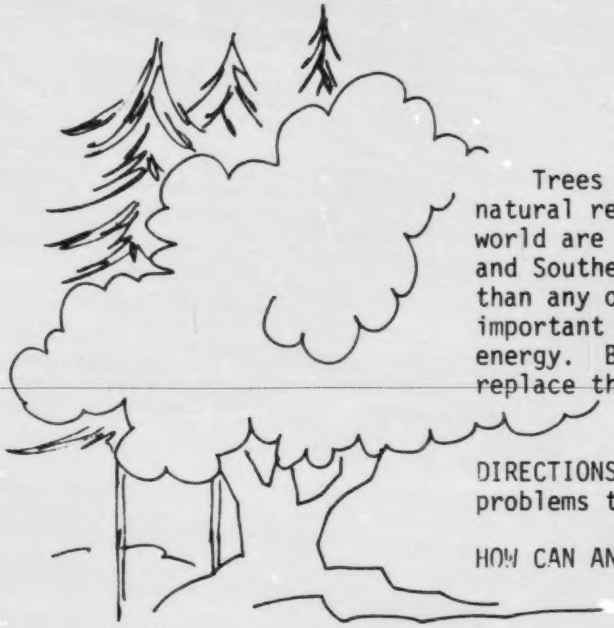
521	413	311	864	973	200	374	287	723	924	226	598
C	N	D	R	A	F	I	N	I	I	O	A

600	899	241	789	790
L	N	U	F	O

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _.



Name ______________________________



Trees are one of California's most valuable natural resources. Among the tallest trees in the world are the redwoods growing in Northern California and Southern Oregon. California has more forest area than any other state except Alaska. Trees are important because they provide a renewable source of energy. By planning wisely we can grow new trees to replace the trees we use.

DIRECTIONS: Use the code and your answers to the problems to solve the riddle.

HOW CAN AN ELEPHANT GET TO THE TOP OF A TREE?

Code Box

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

38 − 19
45 − 36
53 − 33

96 − 81
73 − 59

90 − 89
29 − 15

79 − 78
70 − 67
42 − 27
44 − 26
65 − 51

60 − 59
32 − 18
51 − 47

82 − 59
80 − 79
60 − 51
72 − 52

Name ______________________

San Francisco Bay is important because it provides a large amount of our food. Fishermen take hundreds of pounds of fish from the Bay everyday.

DIRECTIONS: DO the problems to answer the riddle. Draw a line under the correct answer.

1. 3 tens and 4 ones is the same as

   6 fives and 4 ones = O
   2 fives and 6 ones = T
   3 tens and 1 five = B

2. 3 fives and 10 ones is the same as

   2 tens and 2 fives = I
   4 fives and 8 ones = O
   5 fives and 0 ones = N

3. 6 fives and 3 ones is the same as

   4 fives and 6 ones = P
   3 tens and 3 ones = E
   2 tens and 1 five = T

4. 1 ten and 4 fives is the same as

   2 tens and 5 ones = L
   3 tens and 0 ones = B
   2 tens and 1 five = A

5. 1 five and 6 ones is the same as

   2 fives and 1 one = A
   1 ten and 3 ones = O
   3 fives and 0 ones = R

6. 3 tens and 10 ones is the same as

   2 tens and 4 ones = W
   4 tens and 6 ones = E
   4 tens and 0 ones = I

7. 1 ten and 1 five is the same as

   15 ones = T
   2 fives and 4 ones = Y
   1 ten and 3 ones = P

8. 2 fives and 6 ones is the same as

   2 tens and 1 one = M
   3 fives and 1 one = S
   1 ten and 1 five = V

9. 7 fives and 0 ones is the same as

   3 tens and 1 five = H
   1 ten and 4 fives , = K
   6 fives and 2 ones = T

10. 4 tens and 5 ones is the same as

    6 fives and 5 ones = I
    2 tens and 10 fives = A
    9 fives and 0 ones = K

11. 2 tens and 6 ones is the same as

    5 fives and 1 one = R
    1 ten and 2 fives = L
    3 tens and 2 ones = P

Use the letters next to the correct answers to fill in the blank spaces.

WHAT IS THE DIFFERENCE BETWEEN A FISHERMAN AND A LAZY STUDENT?

	O	___	___		___	___	___	___	___		___	___	___
Problem number	1	2	3		4	5	6	7	8		9	6	8

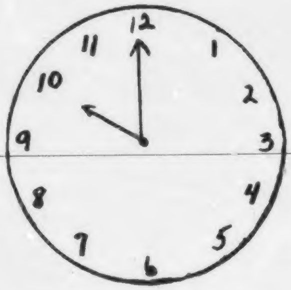
___	O	O	___	-----	___	___	___	O	___	___	___	___	___
9	1	1	10		7	9	3	1	7	9	3	11	

___	___	___	___	___		___	___	___		___	O	O	___.
9	5	7	3	8		9	6	8		4	1	1	10

Name ______________________________

DIRECTIONS: Use the clocks below to solve the problems.

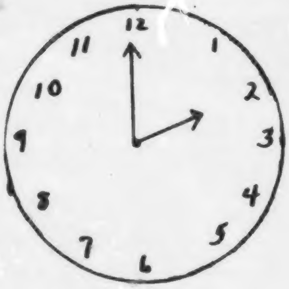
1.



Jackie is going to work at the recycling center today. She said that she would stay for six hours. If she begins at 10:00 A.M., what time will she be through?

____

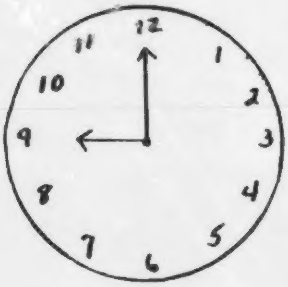
2.



Russ is going to collect newspapers in his neighborhood. It is now 2:00 P.M. It will take him 3½ hours to collect the papers. What time will he be done?

____

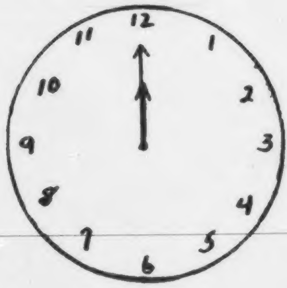
3.



Carolyn and Ed are going to clear the hiking trail of litter. They know the job will take five hours. If they start at 9:00 A.M., what time will they be finished?

____

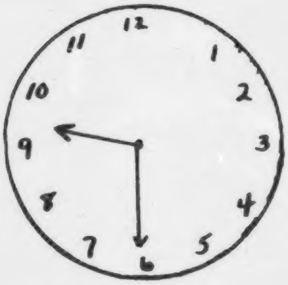
4.



Carlton is spending the day working in his garden. Pulling out the weeds will take him 1½ hours. Planting the new seedlings will take 2½ hours. If he starts at 12:00 P.M., what time will he be done?

____

5.



Betty and Rex are going to help the Rangers plant new trees in the park. It will take them one hour to drive there and four hours to plant the trees. If they leave home at 9:30 A.M., what time will they get home? (Don't forget that they have to drive home too.)

____

Name ______________

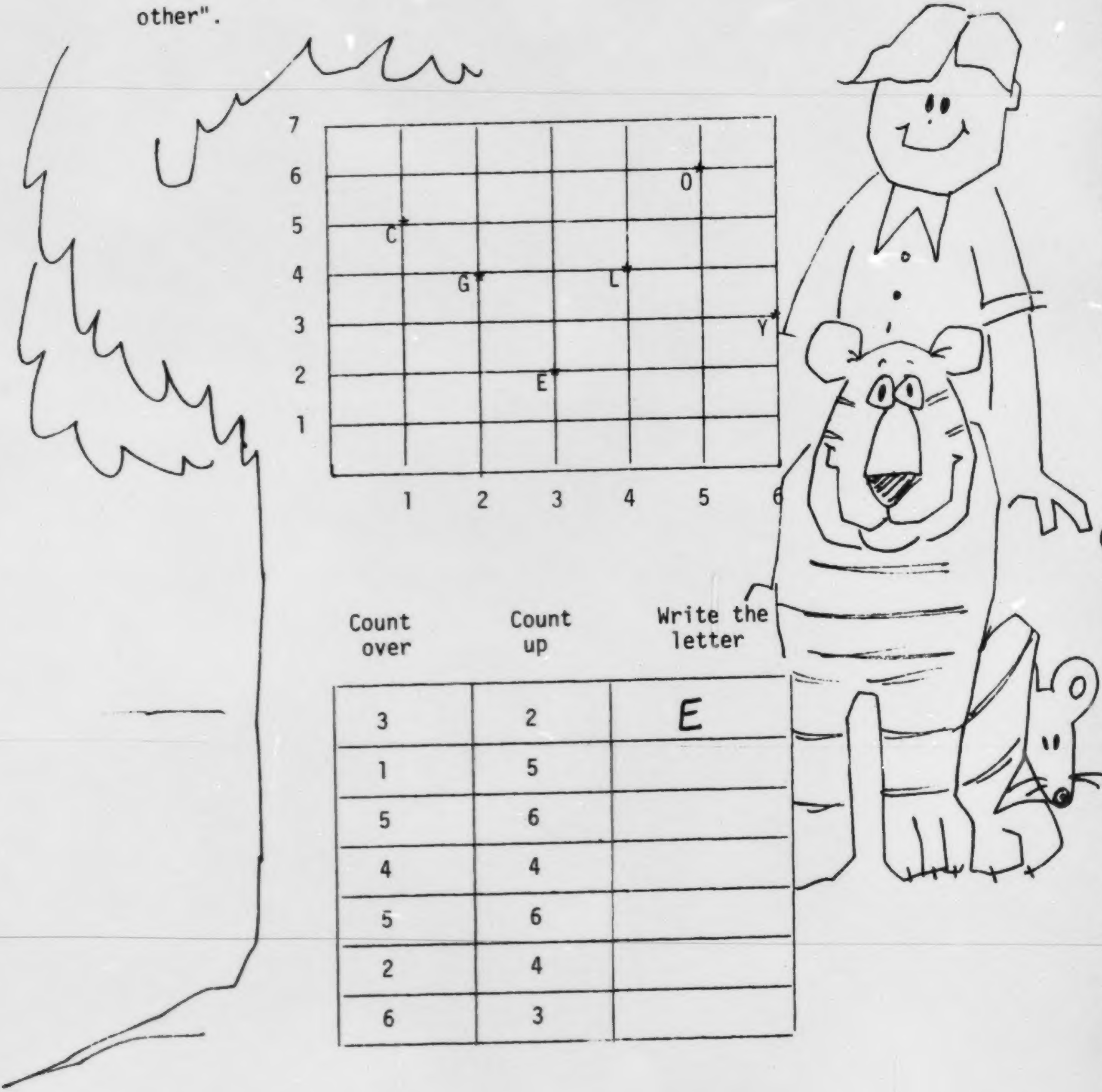
What's the big word that means growing plants without soil?

___ ___ ___ ___ ___ ___ ___ ___ ___ ___
14 8 23 12 19 16 19 15 13 17

D $3\overline{)69}$	P $2\overline{)32}$	N $5\overline{)75}$
I $4\overline{)52}$	R $7\overline{)84}$	H $6\overline{)84}$
Y $9\overline{)72}$	O $4\overline{)76}$	C $5\overline{)85}$

Name ______________________________

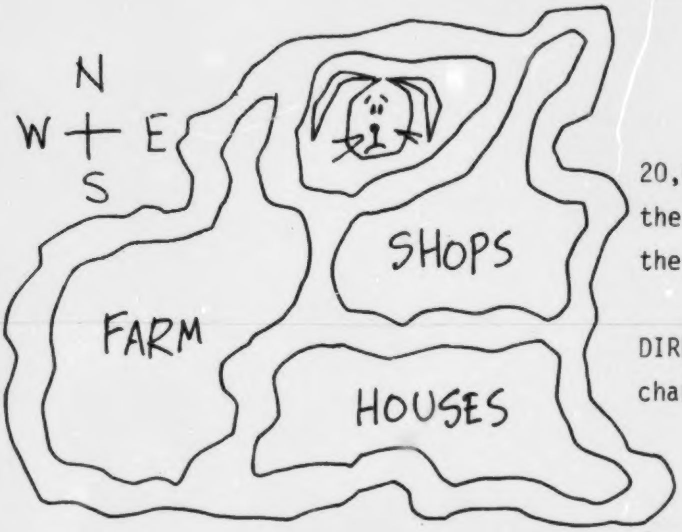
DIRECTIONS: Count over and up to find the word that means "the study of the relationship of living things to their environment and to each other".



Count over	Count up	Write the letter
3	2	E
1	5	
5	6	
4	4	
5	6	
2	4	
6	3	

Write the word ______________________________

Name ______________________________



Rabbit Island is home for more than 20,000 rabbits. Changes are being made on the island which are causing problems for the rabbits.

DIRECTIONS: Read the problems to see what changes are being made. Do the work.

1. There are 325 acres on Rabbit Island. A farmer has bought 90 acres to grow corn. How many acres are left for the rabbits to live on?
   Color the farm area on the island.

3 2 5 acres on the island

- 9 0 acres for the farm

2. A builder has bought 143 acres of the land that is left to build houses on. Now how much of the island is left for the rabbits?
   Color the housing area on the island.

3. A shopping center is being built for the people who will live in the houses. The shopping center needs 48 acres of land for stores and parking. How many acres do the rabbits have now?
   Color the shopping center area on the island.

4. Roads were needed by the people. The roads took up 15 more acres. How many of the original 325 acres do the rabbits have now?
   Color in the road area.

   What do you think will happen to the rabbits?

Name ______________________________

The students in Mr. Campbell's class are collecting newspapers and aluminum cans. They are going to sell them to be recycled in order to make money for the class picnic.

Here are some things you need to know to help them find out how much money they will make for the picnic.

The paper company buys old newspapers. They pay $1.00 for each 100 pounds of newspapers.

The aluminum company pays $ .17 for each pound of aluminum cans. It takes 23 twelve ounce cans to make one pound.

Do the problems to find out how much money they made for their picnic.

1. There are 25 students in Mr. Cambell's class. Each student collected 60 pounds of newspapers. How many pounds did they have all together? How much did they get for the newspapers?

2. Each of the students were able to collect 207 cans. How many aluminum cans was this all together? How many pounds did they have to sell? How much money did they get for the aluminum cans?

3. How much money did the students receive for their class picnic?

Name ______________________________

DIRECTIONS: Read about some of the problems facing San Francisco Bay. Subtract to find the answers to the questions.

1. San Francisco Bay is getting smaller. Much of the marshlands around the Bay has been filled in with dirt to provide land for housing, industry and farming. The original size of the Bay was 680 square miles. Today it is about 400 square miles. How many square miles have been lost due to filling in the marshlands?

   ____________ square miles have been lost due to filling in the Bay.

2. There are 276 miles of shoreline around San Francisco Bay. Almost 266 miles of the shoreline is privately owned. How many miles of the shoreline are left for the use of everyone?

   _________ miles are available for public use.

3. At one time there were more than 300 square miles of natural marshlands surrounding the Bay. These marshlands provided homes and food for thousands of birds and other animals. Now only about 75 square miles of marshlands are left. How many square miles have been lost?

   _________ square miles of marshlands are gone.

4. Everyday almost 400 million gallons of treated sewage and waste are poured into the Bay. Industries are responsible for 269 million gallons of this waste and sewage. The rest comes from private homes. How many gallons of waste and sewage from private homes is poured into the Bay everyday?

   ___________ million gallons of waste and sewage dumped into the Bay comes from private homes.

Name ______________________________

Alice is going to start a hydroponic garden. This means that she is going to grow her plants in water without soil.

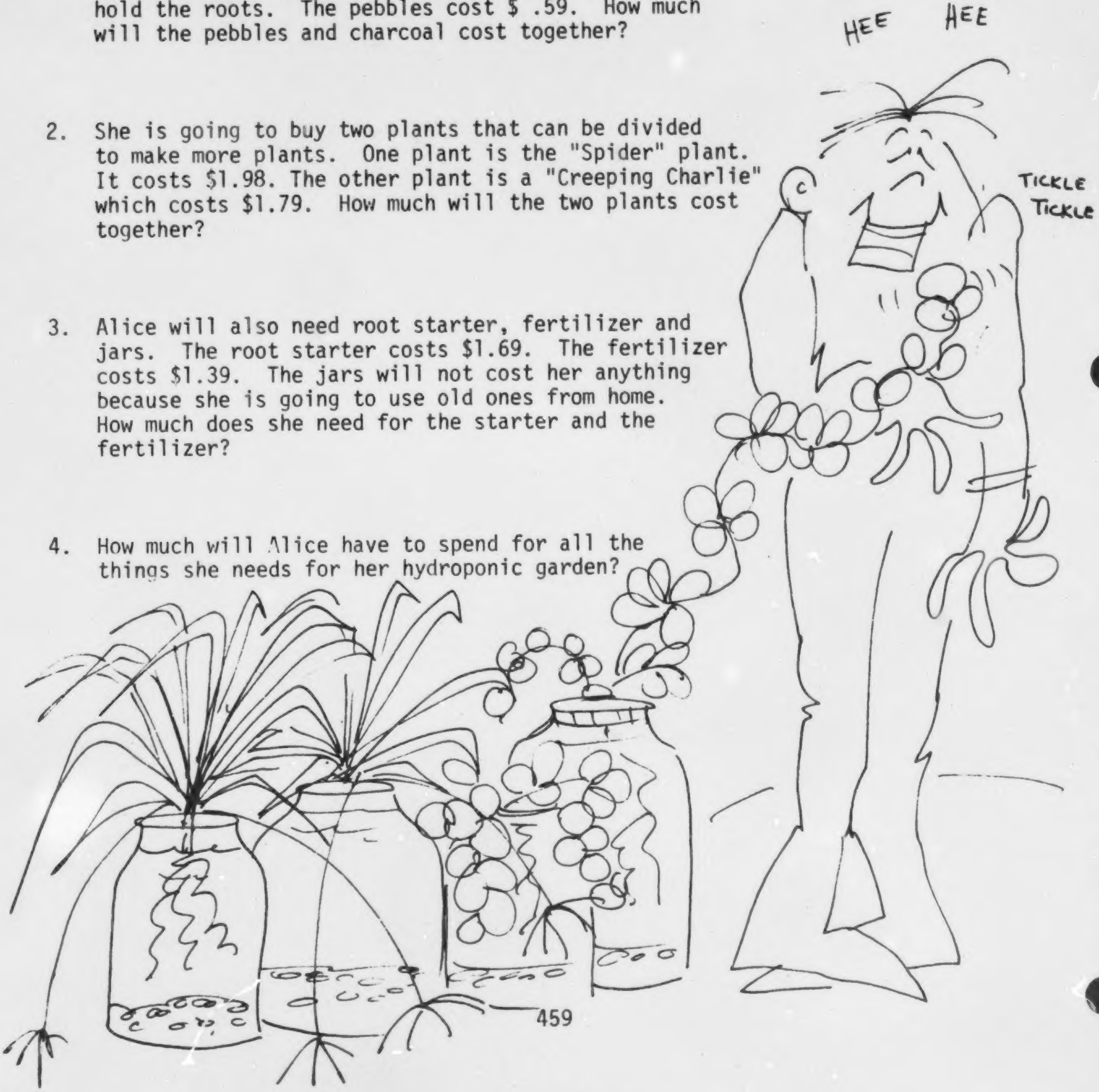
DIRECTIONS: Help Alice add up the cost of the things she needs to buy.

1. Alice needs one box of charcoal to help keep the water clean. The charcoal will cost \$ .79. She also needs one pound of smooth pebbles to help hold the roots. The pebbles cost \$ .59. How much will the pebbles and charcoal cost together?

2. She is going to buy two plants that can be divided to make more plants. One plant is the "Spider" plant. It costs \$1.98. The other plant is a "Creeping Charlie" which costs \$1.79. How much will the two plants cost together?

3. Alice will also need root starter, fertilizer and jars. The root starter costs \$1.69. The fertilizer costs \$1.39. The jars will not cost her anything because she is going to use old ones from home. How much does she need for the starter and the fertilizer?

4. How much will Alice have to spend for all the things she needs for her hydroponic garden?



459

Name ________________________________

Recycling is one way people are helping the "balance of nature." By recycling materials, we save many of the natural resources needed to make the things we use and can make money too.

DIRECTIONS: Read how much money each person made. Write the amounts in standard notation.

1. Joan collected newspapers for recycling. She sold them to a paper pulp company for two dollars, one quarter, and four pennies. ____________________

2. Jack and Bob cashed in their aluminum cans. They made three dollars, four dimes, and one nickle. ____________________

3. Sally returned her deposit bottles to the store. She got one dollar, two quarters, one dime, and one nickle. ____________________

4. Rex saved cardboard which he sold to a scrap dealer. He made three dollars, two dimes, and four pennies. ____________________

5. The Boy Scout troop saved newspapers for a whole year. When they sold them, they made thirty two dollars, one quarter, one dime, and two pennies. ____________________

6. Jennifer saved magazines. The scrap dealers do not want them because much of the paper is coated with plastics and cannot be easily recycled. Jennifer gave them to the hospital instead. She didn't make any money, but she made lots of friends.

Name ______________________________

Forest Rangers do many things to help the 'balance of nature'.

Ranger Dan has five things planned to do today. He is going to stock the creek with baby trout, move a troublesome bear to a new place, and check the campsite for litter that could be harmful to animals. He is also going to clear the hikers' trail on Mt. Smokey and plant some new pine tree seedlings there.

His partner, Ranger Rick, wants to find him but doesn't know at what time he will be where. Help Rick figure out when Ranger Dan will be at each place. Rick has the following information.

1. Ranger Dan will not go to Smokey Mountain before 3:00 P.M.
2. Ranger Dan won't stock the creek or move the bear after 1:00 P.M.
3. Ranger Dan will only clear the trail or stock the creek on the hour.

DIRECTIONS: Write 'no' or 'yes' in every box where you know the answer. Once you have a 'yes', all the other boxes in that row or column must be a 'no'. Remember that Ranger Dan will only be at each place once.

	10:00 A.M.	11:30 A.M.	1:30 P.M.	5:00 P.M.	9:30 P.M.
Plant trees Mt. Smokey					
Clear trail Mt. Smokey					
Stock creek					
Move bear					
Check campsite					

?
BACK IN A JIFFY. -DAN

Name ______________________________

AWK!
EEK!
BEANS

Mrs. Black's class has just read a booklet called "Deadly Throwaways". It told them some reasons why litter is harmful to animals. Here are some things they learned.

Birds can get hung up in strings. Animals can choke on pop tops and plastic wraps. Small animals can fall into bottles or cans. If they can't get out they are either fried, frozen, or starved to death. Garbage that is thrown out of cars attracts animals to the highways where they can get hit by passing cars. Litter can really be dangerous for animals.

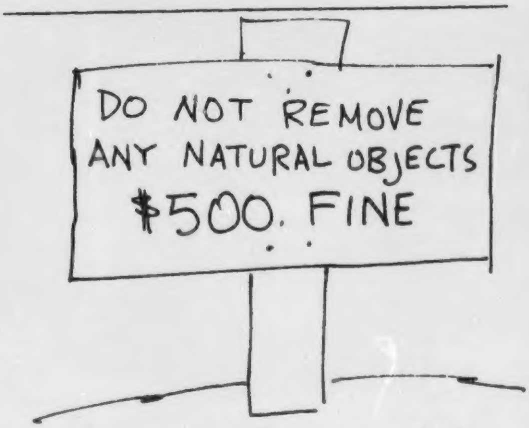
DIRECTIONS: The students decided to have a clean-up day. They formed groups to pick up litter in the neighborhood. Read the problems. Add and divide to find the answers to the two step problems.

1. Bob and Carol and Ted and Alice were in the first group. They went to the park. Ted and Alice picked up 33 pop tops. Bob and Carol picked up 51 pop tops. How many did the first group pick up all together? How many was this for each person?

2. The students in group two picked up empty pop bottles. Marcia found 14 bottles. Betty and Sue found 19 bottles. How many bottles did the three girls find all together? How many was this for each girl?

3. The third group filled bags with papers and other litter. Sam filled 7 bags with litter. Sandy and Mark each filled 4 bags. How many bags did group three fill all together? How many bags would this be for each person?

Name ______________________________



Many parks and natural areas have signs telling people that it is against the law to take rocks, plants, or animals home with them.

Some people think that one little rock, flower or starfish isn't going to be a big deal. Is it?

DIRECTIONS: Do the word problems to see what could happen if everyone thought that way.

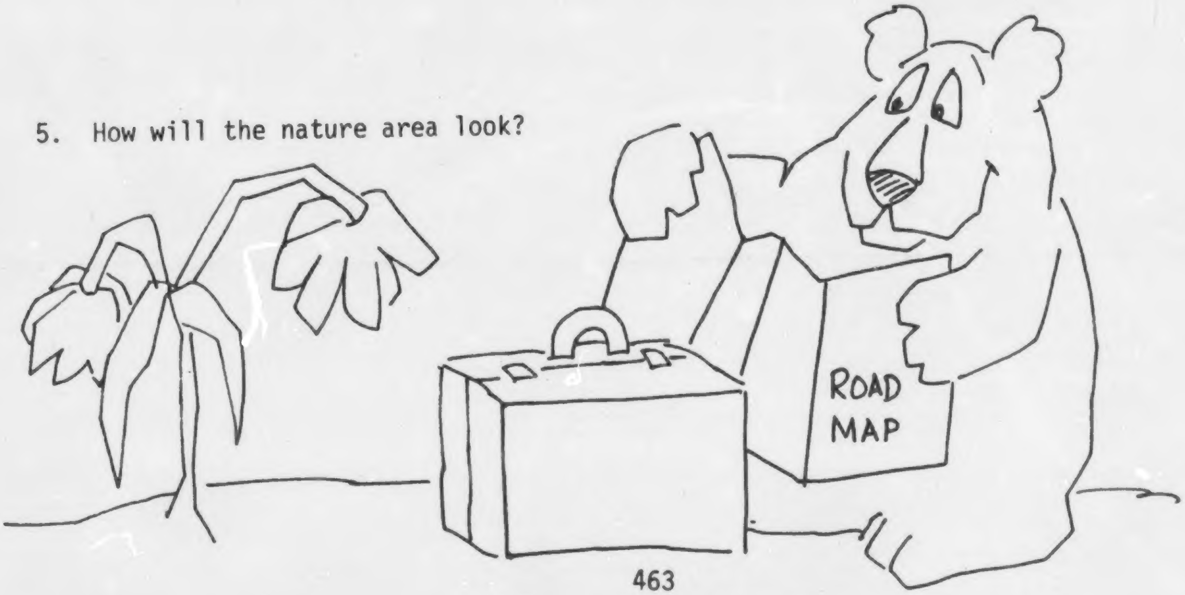
1. Three classes of students visit Natural Bridges nature area every day. Each class has 30 students. If each student takes home just one little rock, how many little rocks will be gone in one day?

2. How many little rocks will be gone in one week (7 days)?

3. How many little rocks will be gone in one month (30 days)?

4. How many little rocks will be gone in one year (12 months)?

5. How will the nature area look?



Name ______________________________

Are your classmates energy savers?

12				
11				
10				
9				
8				
7				
6				
5				
4				
3				
2				
1				
	car	bus	bike	walking

Ask 12 of your classmates how they got to school - by bike, car, walking, or the bus? Write their answers on the lines below. Use this information to make a bar graph.

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________
6. ______________________________
7. ______________________________
8. ______________________________
9. ______________________________
10. ______________________________
11. ______________________________
12. ______________________________

Name ______________________________

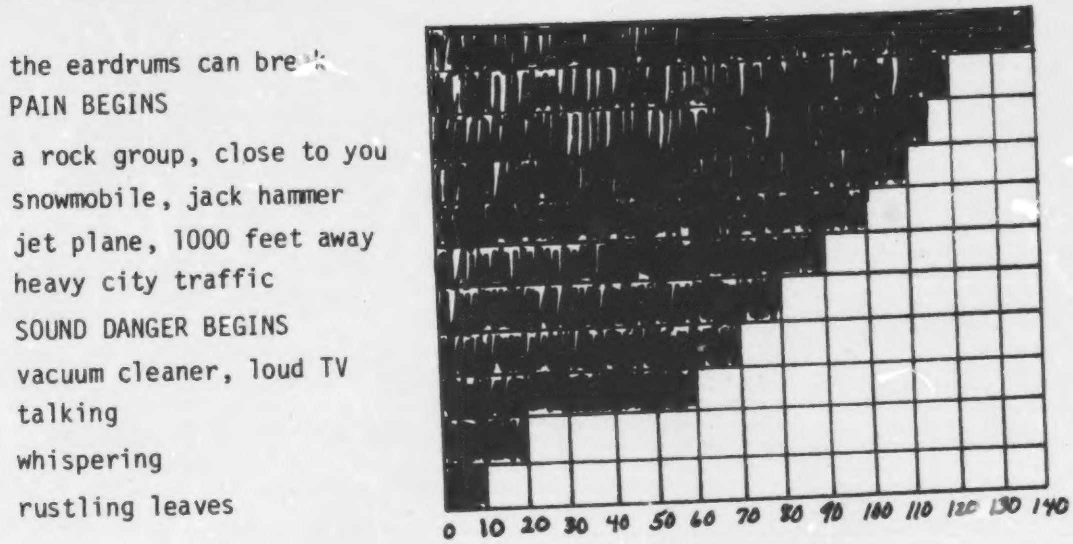
NOISE

Noise is another type of pollution. The sounds of people and machines fill the air of busy cities, and even the country sometimes. We hear the sounds of jet planes, automobiles, TV, and hundreds of other things every day.

People get used to noise pollution and learn to shut sound out of their minds. But steady noise can make people lose sleep, have accidents, get tired, behave angrily, and even become deaf.

Noise pollution is measured in decibels. At zero decibels, a sound is so soft you can hardly hear it. At 180 decibels, noise can kill you.

Common Sounds in Decibels



Use the decibel graph to answer the following questions.

1. How many decibels is a loud TV? __________
2. How many decibels is heavy city traffic? __________
3. Which is louder, a snowmobile or a vacuum cleaner? __________________
4. At what decibel level does sound actually hurt your ears? __________
5. At what decibel level does noise become dangerous? __________
6. What decibel level can break your eardrums? __________

Name ______________________________

DIRECTIONS: Read the story. Draw a line under all the number words. Answer the questions at the bottom of the page.

The Giant Panda

The giant panda is probably the rarest of all animals. Although the panda looks like a bear, it is actually related to the raccoon. It can only be found in one place in all the world - the bamboo jungles between China and Tibet. Perhaps it is called "giant" because it grows to a weight of three hundred pounds and a length of five feet. It is an endangered animal mostly because of over-hunting and the many numbers who have been caught for zoos. In 1936, the first live giant panda brought to the United States weighed only five pounds. It cost nearly nine thousand dollars. Fifteen months later, the giant panda, "SU-Lin" died at the Brookfield Zoo in Chicago.

Use the story to answer the questions. Write your answers as standard numerals.

1. How much can a grown giant panda weigh? ____________________

2. How tall does a giant panda get to be? ____________________

3. How much did the first giant panda cost the zoo? ____________________

4. How long did the giant panda live at the zoo? ____________________

Name ______________________________

DIRECTIONS: Read the story. Use the information to answer the questions.
Be sure to write your answers as standard numerals.

ENDANGERED ANIMALS

EXTINCT
COO COO
BIRD

The United States government began keeping lists of endangered and threatened wildlife in 1967. They now list one hundred seventy-four kinds of endangered animals and eleven more that are threatened.

Many of these animals are found in California. It is believed that there are now less than twenty-nine California Condors still alive. The Salt Marsh Harvest Mouse population is said to be below one thousand due to the changing conditions of San Francisco Bay.

Laws and wildlife management have helped some animals. For example, in 1935 there were less than ninety-five Trumpeter Swans alive. A national refuge was built to protect their habitat and, at last count in 1970, there were more than one thousand forty birds alive.

We can protect our wildlife.

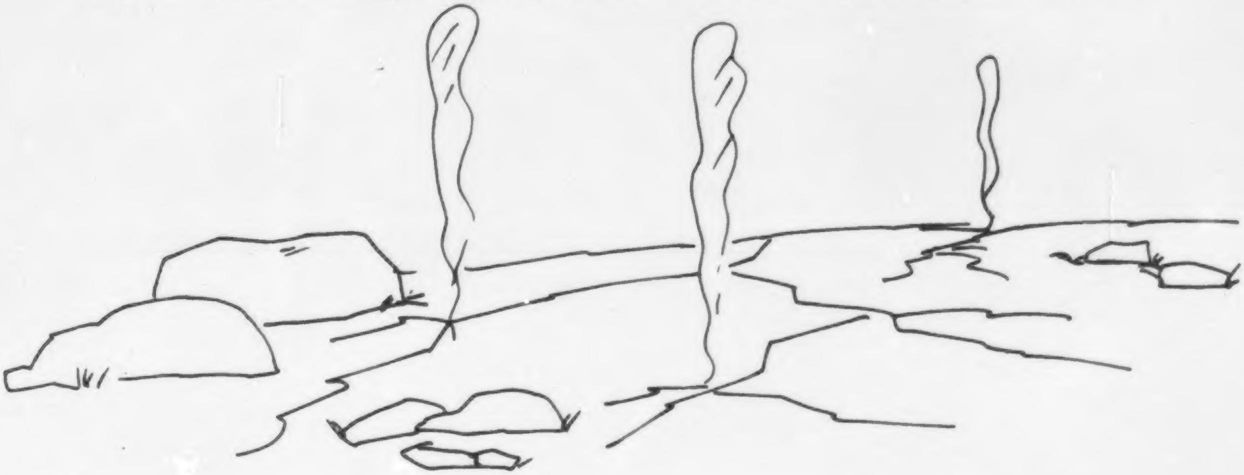
Complete the sentences by writing the correct numerals in the spaces.

1. The United States government lists __________ kinds of endangered animals.
2. There are _________ more animals that are threatened.
3. There are less than __________ California Condors still alive.
4. The Salt Marsh Harvest Mouse population is said to be below ____________.
5. The Trumpeter Swan population has grown from ____________ in 1935 to
____________ in 1970.

Name ______________________________

DIRECTIONS: Follow the instructions in each sentence to answer the question.

What do we call energy that is produced from underground steam and heat?



___	___	___	___	___	___	___	___	___	___
1	2	3	4	5	6	7	8	9	10

Space Number	Instructions
1.	If 4 X 4 = 16, write G. If not, write P.
2.	If 7 ÷ 3 = 21, write O. If not, write E.
3.	If 38 + 14 = 52, write O. If not, write C.
4.	If 99 ÷ 9 = 11, write T. If not, write A.
5.	If 64 X 8 = 8, write D. If not, write H.
6.	If 8 - 4 = 12, write O. If not, write E.
7.	If 9 X 5 = 45, write R. If not, write P.
8.	If 100 ÷ 20 = 5, write M. If not, write I.
9.	If 25 + 25 = 0, write H. If not, write A.
10.	If 42 - 7 = 35, write L. If not, write T.

Name ______________________________

Water is one of our most important natural resources. We could not live without it. We borrow it from the natural water cycle, use it, and then return it to the cycle. Water is not used up, but recycled. We must clean the used water before returning it to the water cycle. If it is not cleaned, then we have polluted water. The more we use, the more we have to clean.

It takes a lot of water to make the things we use.

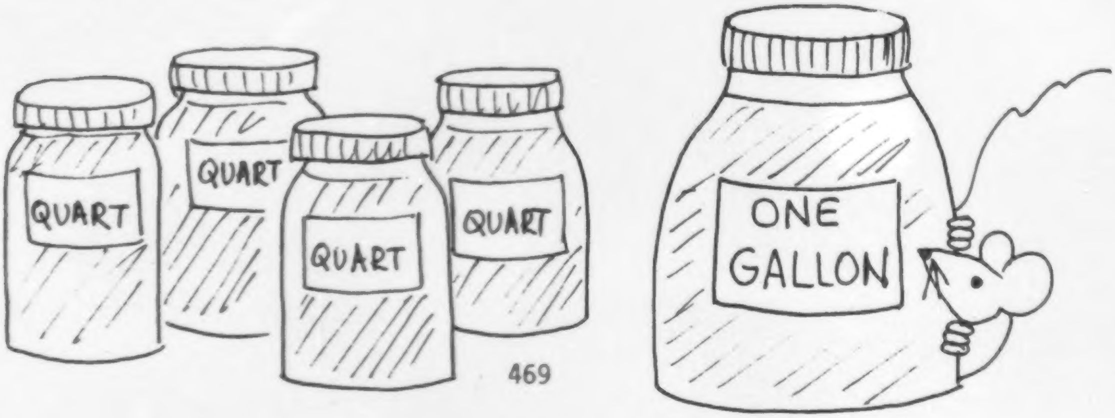
DIRECTIONS: In the problems below, change the quart measurements to gallons by dividing. Remember that it takes 4 quarts to make 1 gallon.

1. It takes 600 quarts of water to make the paper for one Sunday newspaper. How many gallons is that?

2. It takes 2600 quarts of water to make the steel for one bicycle. How many gallons is that?

3. It takes 300 quarts of water to grow just one ear of corn. How many gallons are needed?

4. It takes 800 quarts of water to make the rubber for one car tire. How many gallons is that?



Name ______________________________

GOLD MINING

The discovery of gold in 1848 brought thousands of people to California. They came to make their fortunes by mining for gold.

The first miners used only a pick, shovel and wash pan. They scooped up sand and gravel from the river and then swirled it around so that the heavier gold stayed in the bottom of the pan. This method of panning for gold was very slow so some miners invented a faster way.

They made a 'rocker' or 'cradle'. This was a wooden box with a wire bottom that was mounted on curved runners. Dirt was shoveled into the box and then water was poured through the cradle as it was rocked. The sand and dirt washed through the screen but the larger gold nuggets remained. This way was faster than gold panning but some people felt they could do it still faster.

These miners used 'sluice boxes'. These were large, long boxes with screen bottoms that were placed in or next to the river. Water and gravel ran through the boxes and the screen again trapped the gold. Sluice boxes were faster than panning or rockers but still the miners looked for a faster way.

Next came 'hydraulic' mining and dredging. These were far faster than all the other ways. Hydraulic mining uses water from a large hose to wash away soil and rocks. Sometimes the force of the water was so great that it also washed away trees and boulders as well as the soil. Whole mountains could be washed away by hydraulic mining.

Gold dredgers were large machines that floated on the river waters. A large scoop on the dredger dug out a channel ahead of the dredger and then dumped the wasted behind it into the river. These two methods of mining produced more gold faster than all the other ways but left piles of rocks and waste and destroyed rivers and the lands along the shores. The results of these methods can still be seen today even though the miners have been gone for over a hundred years.

Answer the following questions. Write your answers on the back of this paper.

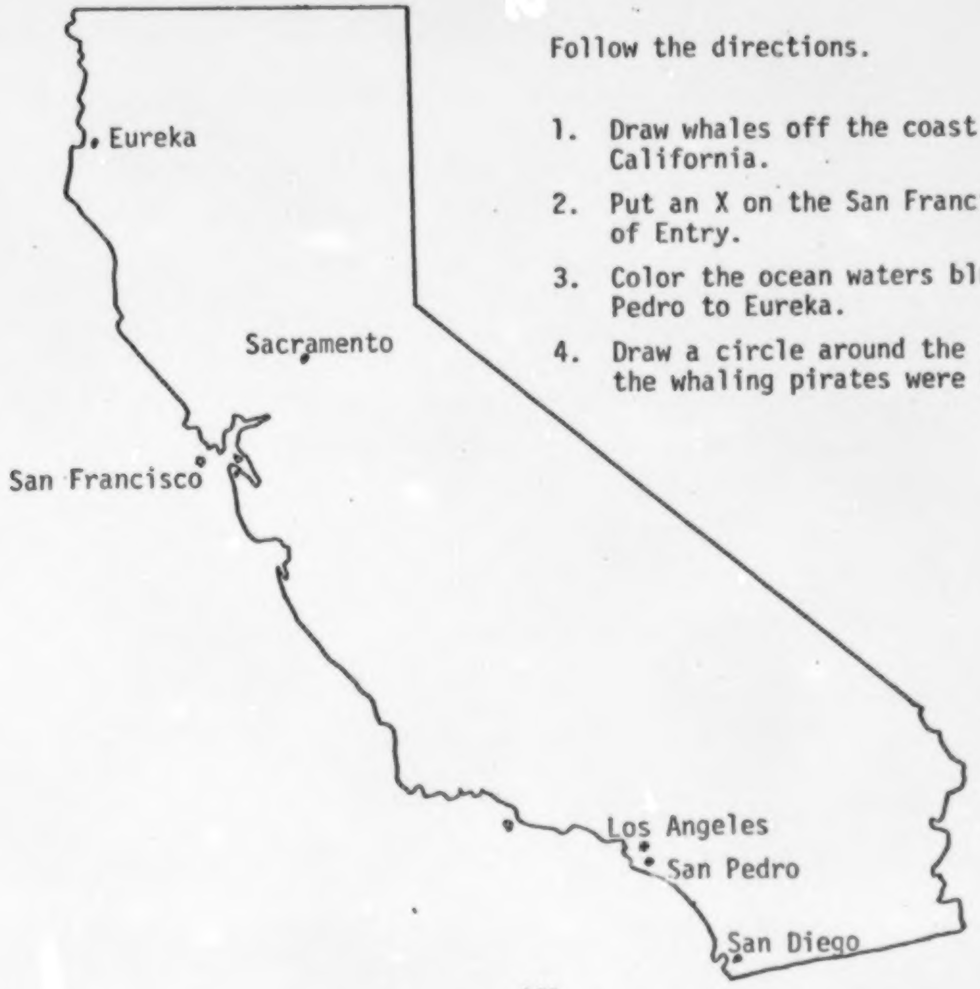
1. Which type of mining did the least damage to the environment?
2. Which types of mining produced the most gold?
3. What did hydraulic mining do to the environment?
4. What did gold dredgers do to the rivers?
5. If dredgers and hydraulic mining were so destructive to the environment, why did the miners still use these methods?

Name ______________________________

Whaling was an important industry in early California. In 1838, there were more than 238 whaling ships in ports from San Pedro to Eureka. There were many humpback, sperm, and other kinds of whales living in the ocean waters off California. Whale hunters would kill 10 or 12 whales on a single trip, and return to port with as much as 1500 barrels of whale oil.

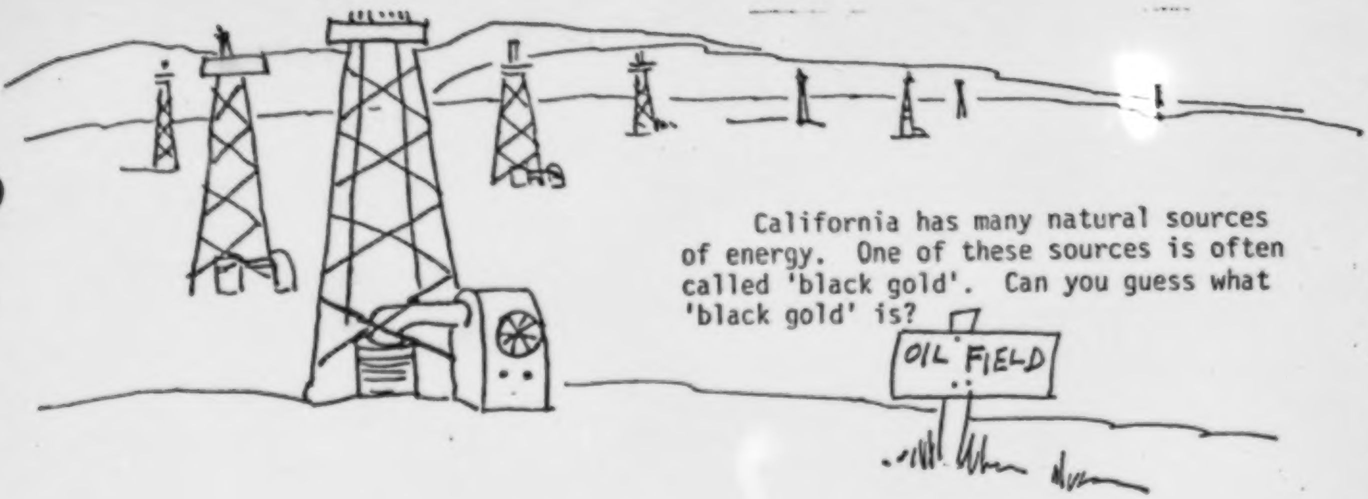
The killing of the whales decreased for awhile when Commandant Meriano Vallejo, of the San Francisco Port of Entry, issued an order requiring licenses for any whaler entering a California port. After Vallejo's order, whalers became like pirates. Some were captured by the Spanish and imprisoned on Alcatraz Island. Many of the whaling pirates became ill and died from staying in the damp cold caves and dungeons.

Today, whales are almost extinct. Groups, such as Greenpeace, are trying to help save and preserve this largest of all mammals.



Follow the directions.

1. Draw whales off the coast of California.
2. Put an X on the San Francisco Port of Entry.
3. Color the ocean waters blue from San Pedro to Eureka.
4. Draw a circle around the island where the whaling pirates were sent.



California has many natural sources of energy. One of these sources is often called 'black gold'. Can you guess what 'black gold' is?

In the early 1900's a second Gold Rush began in California. This gold was black. Oil had been discovered.

Hundreds of new pioneers came to California to make their fortunes in the oil fields. Many of the oilmen, like the gold miners, were rough and rugged in their search for oil. Claims for rights to oil fields near the towns of Taft and Coalinga were staked and protected as they had been during the gold rush, with fists and guns.

The demand for oil grew. Oil was needed as a fuel to produce electricity. Refined oil, which is gasoline, was needed as a fuel for the new 'horseless carriages'. New oil wells were started almost everyday. Hundreds of wells were dug in the San Joaquin Valley and Kern River Oil Fields. Land, which ten years before had been traded for a few cows, now sold for a thousand dollars an acre and more. Oil wells were drilled everywhere. Some oil derricks were even built in the backyards of many Southern California homes.

Today, California ranks second only to Texas as the greatest oil production state. However, Alaska may soon challenge both Texas and California as oil flows from the new Alaskan pipeline.

Write the answers to these questions on the back of this paper.

1. What is black gold?
2. How did the discovery of oil change the population of California?
3. What happened to the cost of land in California?
4. How important is California in the production of oil?

Name ______________________________

Natural Sources of Energy in California

Key

O = oil sources

▨ = forest areas

∿ = rivers

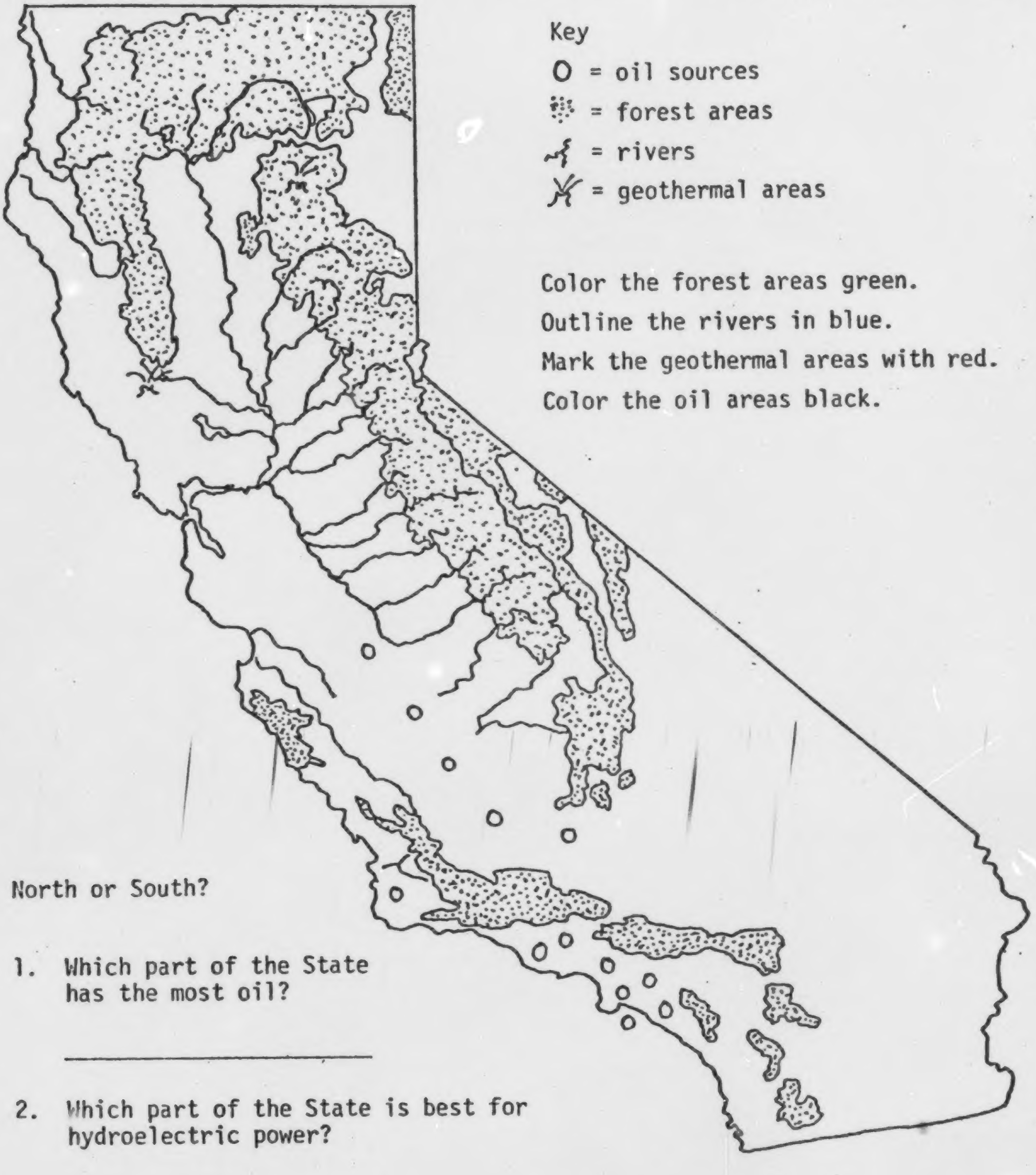
✱ = geothermal areas

Color the forest areas green.

Outline the rivers in blue.

Mark the geothermal areas with red.

Color the oil areas black.



North or South?

1. Which part of the State has the most oil?

____

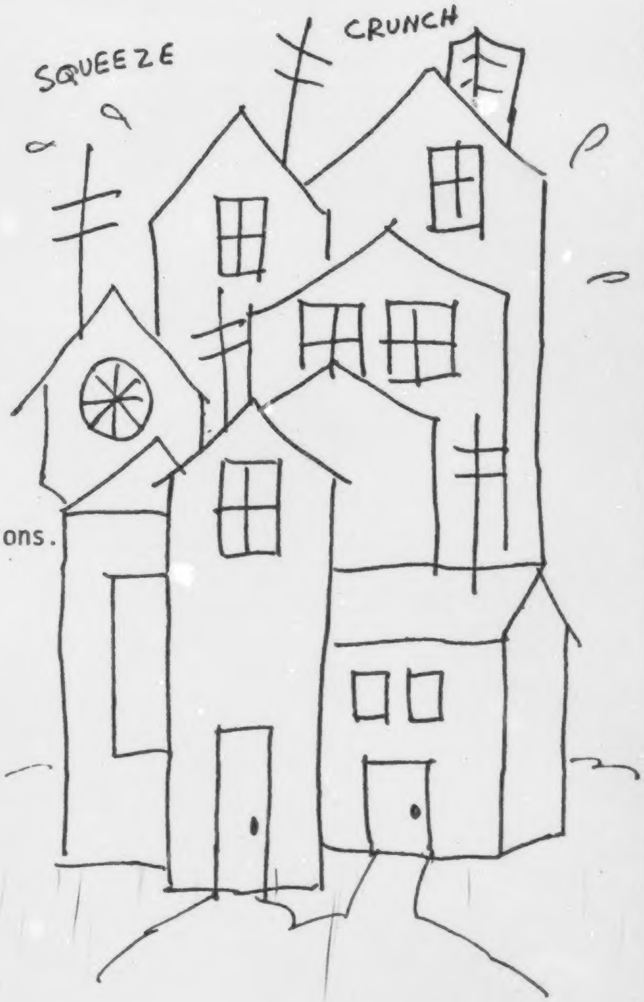
2. Which part of the State is best for hydroelectric power?

____

3. Which part of the State are the geothermal areas located? ____________

Name ______________________________

How Should We Use Our Land?



More and more people move to California everyday. This growing population has made many changes in the land.

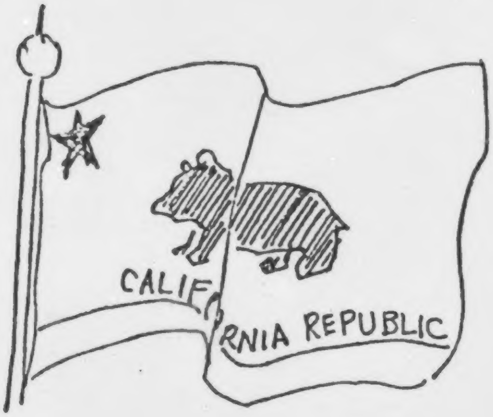
More people need more homes. To get the wood to build these houses, more trees need to be cut down. Forests are disappearing. More land is needed to build the houses on. The easiest place to build houses is on flat farm lands. Thousands of acres of fruit orchards have been torn down to make room for new houses and groups of houses called subdivisions. Freeways and roads have been built through country lands to provide easier transportation.

But, more people also need more food. Much of the farm lands have been used to put houses on. Where will the food come from?

Choose one of the following solutions or make up your own. Use the back of this paper to explain why you think it is a good idea.

1. We should grow fruits and vegetables in the mountains or deserts where there aren't many houses.
2. We should not allow any more people to move to California.
3. Scientists can invent chemicals and vitamins for people to eat instead of food that is grown in the ground.
4. Houses should be built in the mountains and deserts instead of on farm lands.
5. Everyone should eat less food.
6. My idea is ....

Name ______________________________



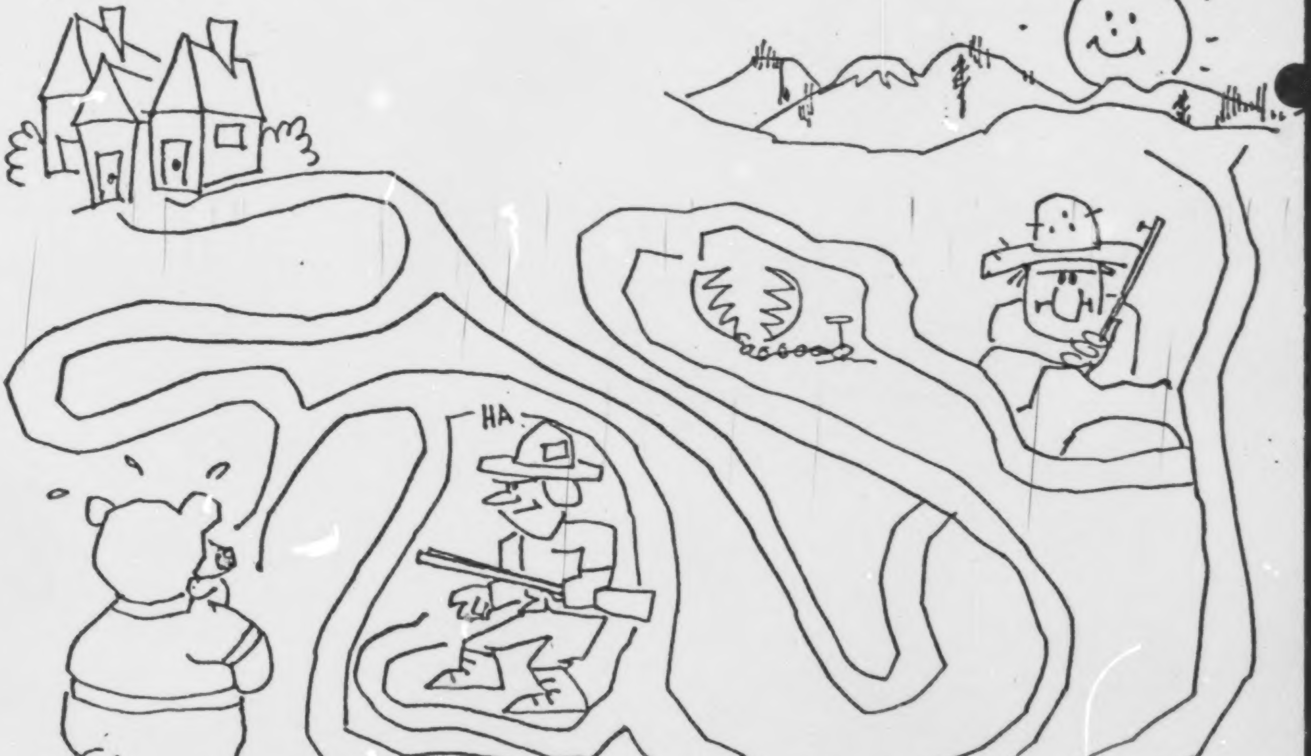
The Grizzly Bear

The grizzly bear is the state animal of California. His picture is on our state flag and on the state seal. This is sort of strange because there are no grizzly bear in California now.

At one time, there were hundreds of thousands of grizzly bears living in the western parts of North America, from Mexico to Alaska. Today, there are only about 600 grizzlies left in the whole United State Most of these bears live in and around Yellowstone National Park and the Rocky Mountains.

Most of the grizzly bears left California because of people. Grizzlies need large areas of wilderness. They do not get along well with people. Many were killed because people felt they were dangerous and a threat to livestock. Many others were killed for sport or for their fur pelts.

Help the grizzly bear find his way through the maze to the safety of the mountains.

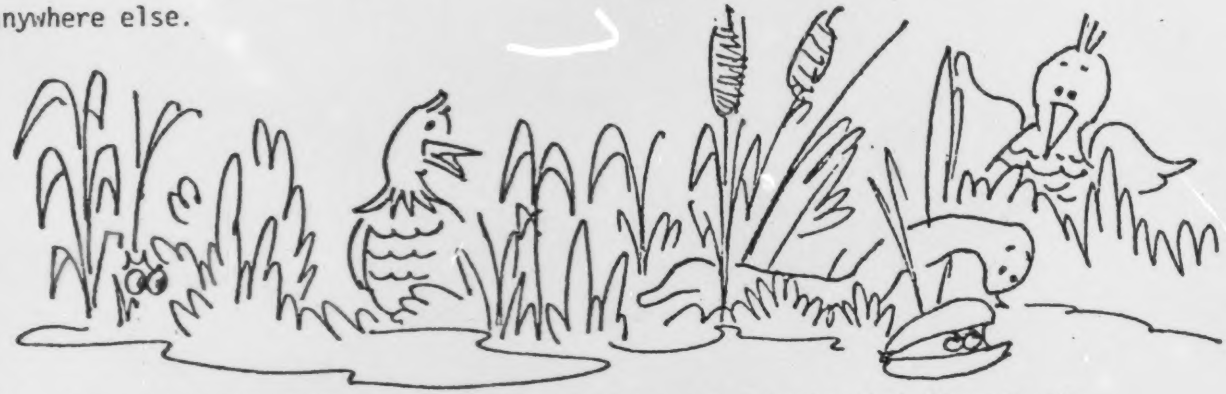


Name ______________________________

The Marshlands

The marshlands around the San Francisco Bay provide a home for many different kinds of wildlife. It is a special environment because of the mixture of salt water and fresh water. The salt water comes into the Bay from the Pacific Ocean. The fresh water comes from the many rivers that end in the Bay.

The marshlands are a habitat for many plants and animals that could not live anywhere else.



Use the code to find the names of four plants and animals that live in the marshlands.

A 1	B 2	C 3	D 4	E 5	F 6	G 7	H 8	I 9	J 10	K 11	L 12	M 13
N 14	O 15	P 16	Q 17	R 18	S 19	T 20	U 21	V 22	W 23	X 24	Y 25	Z 26

1. ___ ___ ___   ___ ___ ___
13 21 4   8 5 14

2. ___ ___ ___ ___ ___
3 12 1 13 19

3. ___ ___ ___ ___ ___ ___   ___ ___ ___ ___ ___
7 15 16 8 5 18   19 14 1 11 5

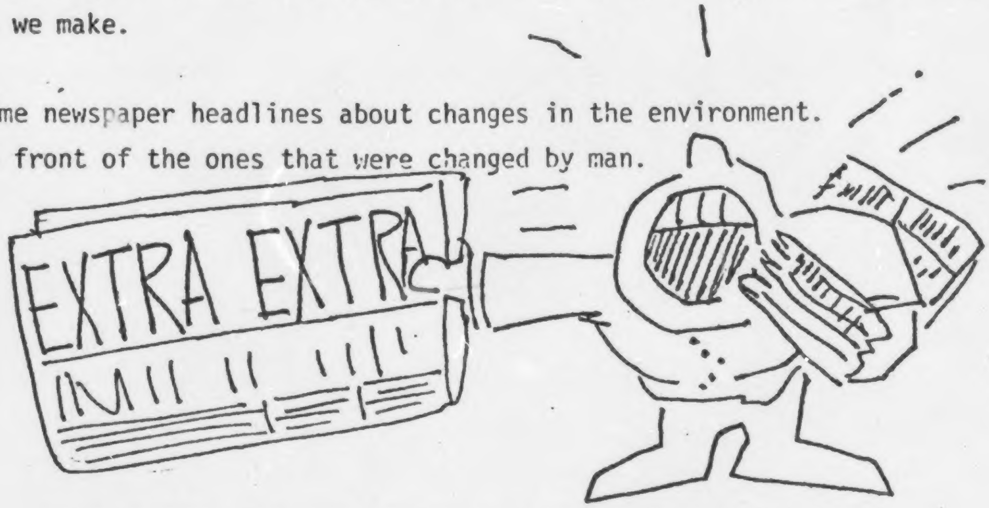
4. ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
16 9 3 11 12 5 23 5 5 4

Name ____________________

Our Changing Environment

Man is the only living thing that can change his environment to meet his needs. Some of these changes have not hurt the environment. But, some of the changes have damaged the earth, air and water. We are now beginning to look more carefully at the changes we make.

Here are some newspaper headlines about changes in the environment. Put an X in front of the ones that were changed by man.



_____ HETCH HETCHY DAM BUILT TO PROVIDE WATER FOR SAN FRANCISCO

_____ LIGHTNING CAUSES 600 ACRE FOREST FIRE

_____ TWO HUNDRED HOMES TO BE BUILT ON OLD MACDONALD'S FARM

_____ SMOG ALERT TODAY

_____ EARTHQUAKE DAMAGES SAN FRANCISCO

_____ MORE FILL DUMPED IN SAN FRANCISCO BAY TO PROVIDE LAND FOR HOMES

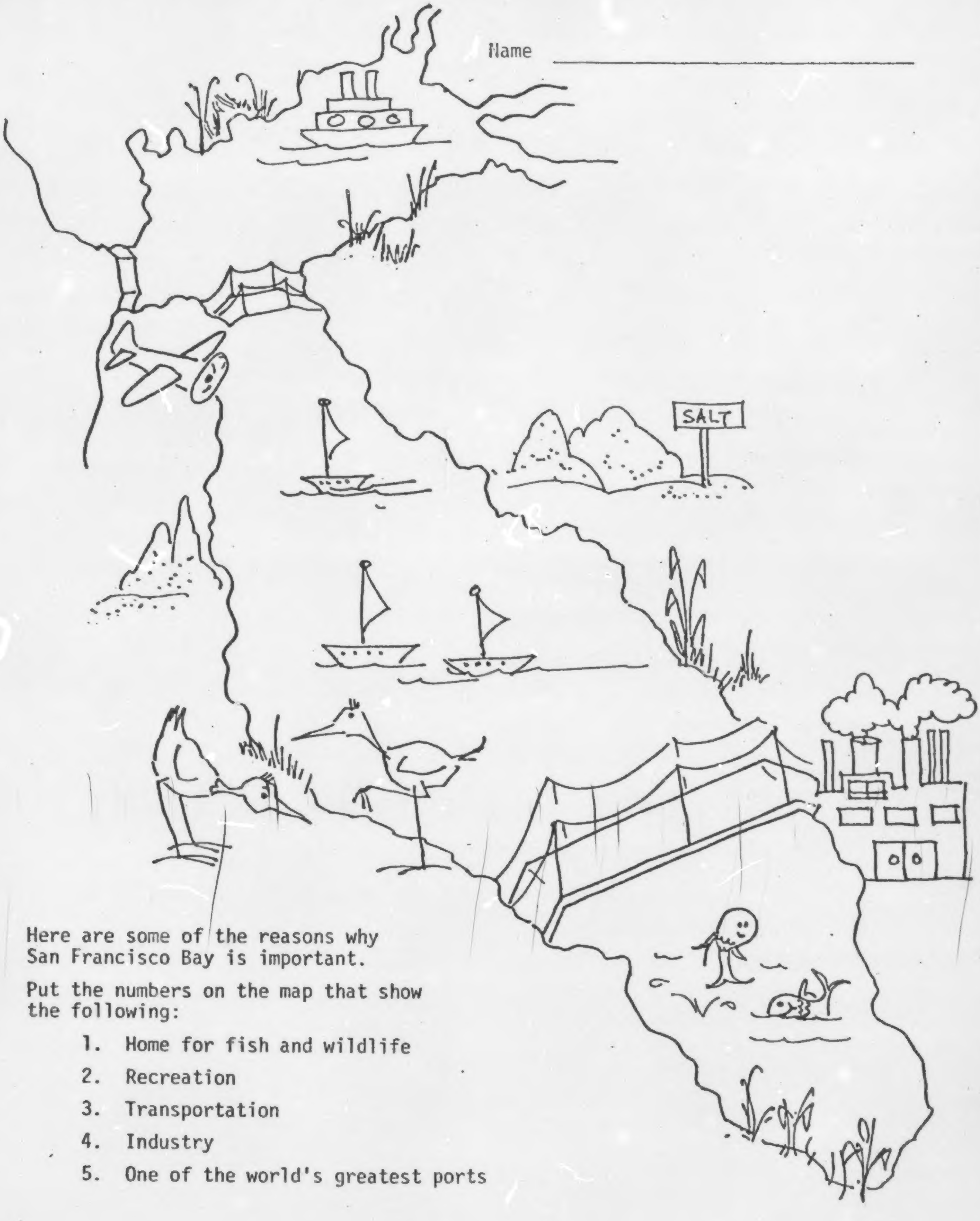
_____ FLOODING CAUSED BY HEAVY RAINS

_____ BROWN PELICAN DEATHS LINKED TO PESTICIDE USE

_____ THIRTY ACRES OF TIMBER CUT TO PROVIDE MEADOW CAMPING GROUND

_____ SIX LANE HIGHWAY COMPLETED THROUGH SIERRA NEVADA MOUNTAINS

Name ______________________________

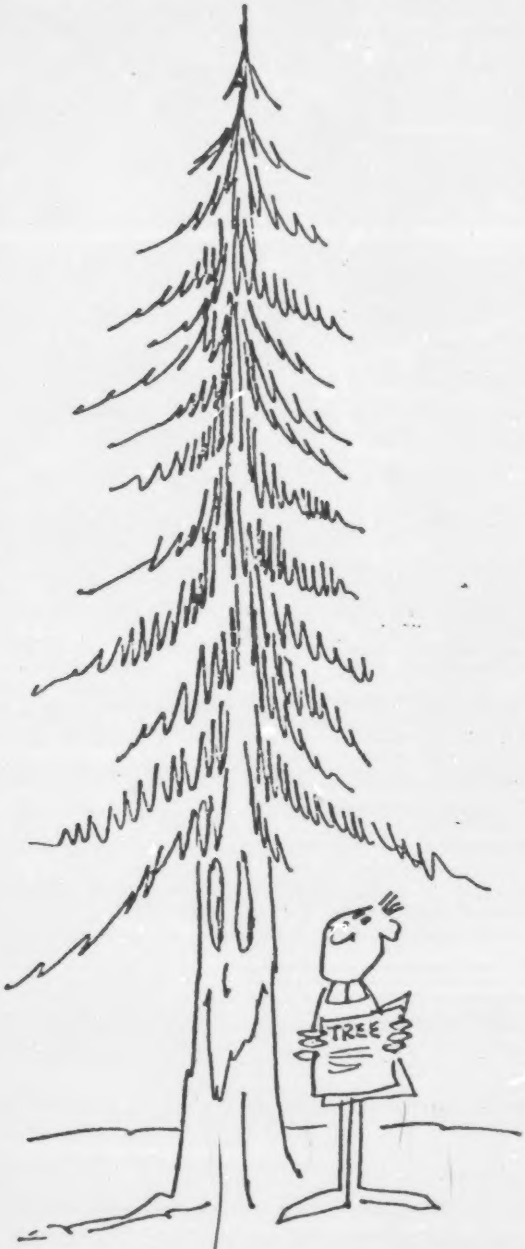


Here are some of the reasons why San Francisco Bay is important.

Put the numbers on the map that show the following:

1. Home for fish and wildlife
2. Recreation
3. Transportation
4. Industry
5. One of the world's greatest ports

Name ______________________________



Redwood Trees

The redwood tree is the state tree of California. Thousands of years ago, redwood trees grew along the Pacific coast from California to Alaska. The ice age covered and killed most of these redwood trees. Now two kinds, the Coast and Sierra Redwoods, grow only in California.

Both kinds of redwood trees are called Sequoias in honor of a Cherokee Indian chief. Chief Sequoyah invented an alphabet which taught the entire Cherokee nation to read and write in six months.

A coast redwood tree is the tallest tree in the world. It is 328 feet tall. Some Sierra redwoods have been living for more than three thousand years.

The redwood trees are an important natural resource in California. People have used redwood lumber for many things. The wood lasts much longer than other kinds of wood. Redwood is not good for fires because it does not burn easily. This is because there is no pitch in the wood.

Not much Sierra redwood lumber is cut today because most of the trees are in National and State Parks. They are protected by law.

Write the underlined letters on the blank spaces. If you copy them in order, you will learn something else about redwood trees.

_ _ _   _ _ _ _ _ _ _ _ _ _   _ _ _ _ _ _ _ _

_ _ _   _ _ _   _ _ _ _ _ _ _   _ _ _ _ _ _

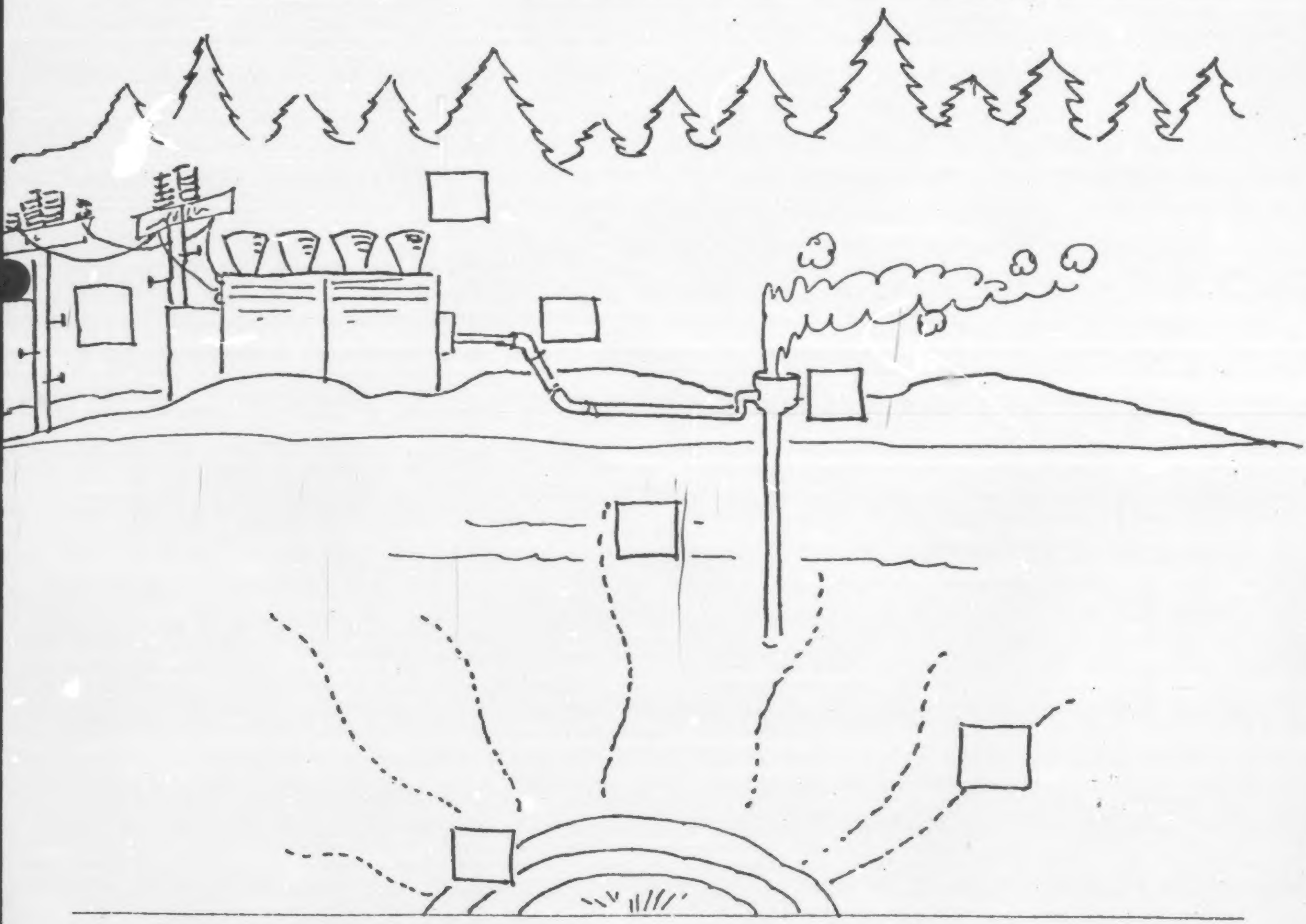
_ _ _ _ _ _   _ _   _ _ _   _ _ _ _ _ !

Name ______________________________

How Geothermal Energy Works

1. Magma, the molten rock found deep in the earth, is the source of the heat.
2. The heat energy warms the soil and rocks above the magma.
3. Underground water is heated by the soil and rocks.
4. A well is dug to reach the hot water and steam.
5. A pipe in the well carries the hot water and steam to a generating plant.
6. The steam turns turbines in the plant to generate electricity.
7. Electricity is sent to cities through transmission lines.

DIRECTIONS: Put the numbers in the boxes to show where each thing happens.



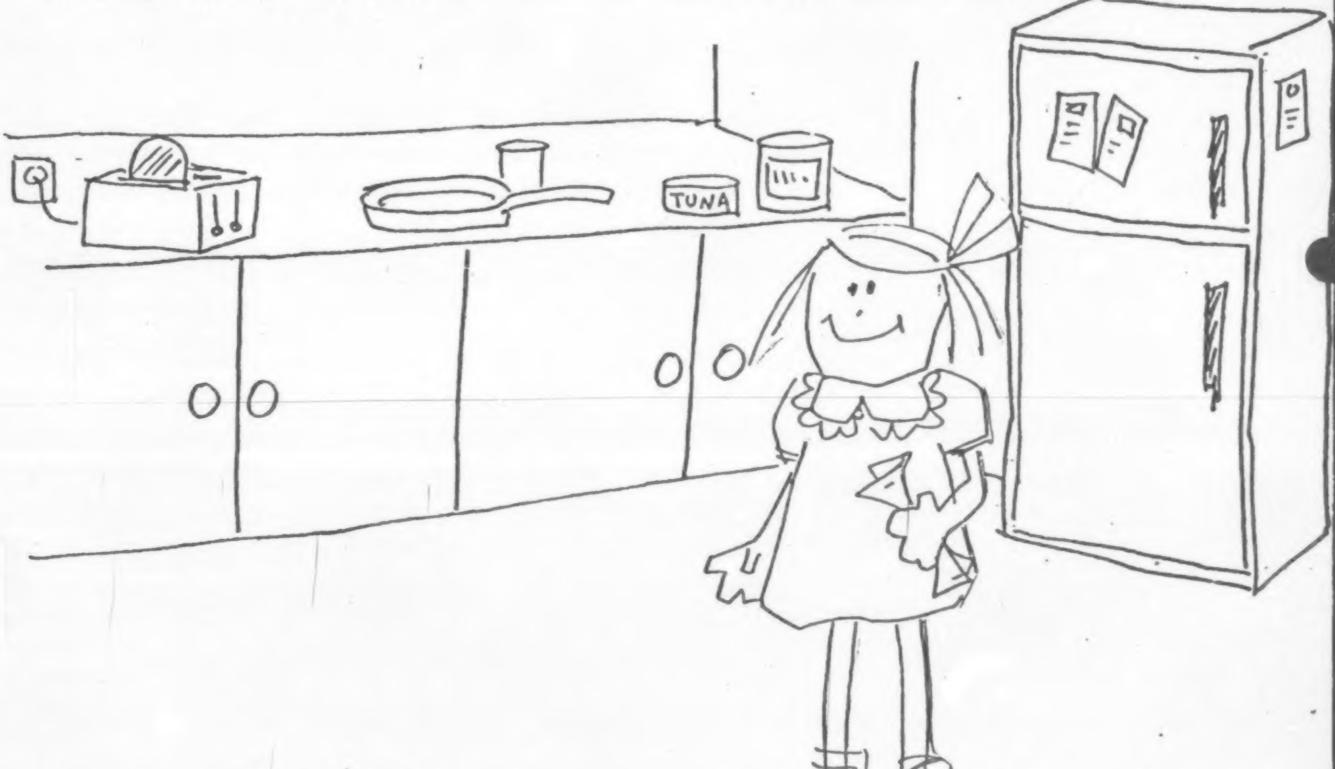
Name ______________________________

Rocks and minerals are necessary to our everyday life. Plain old rocks, that may be sliced or broken up, are often used as building materials, in gardens, and in making roadways.

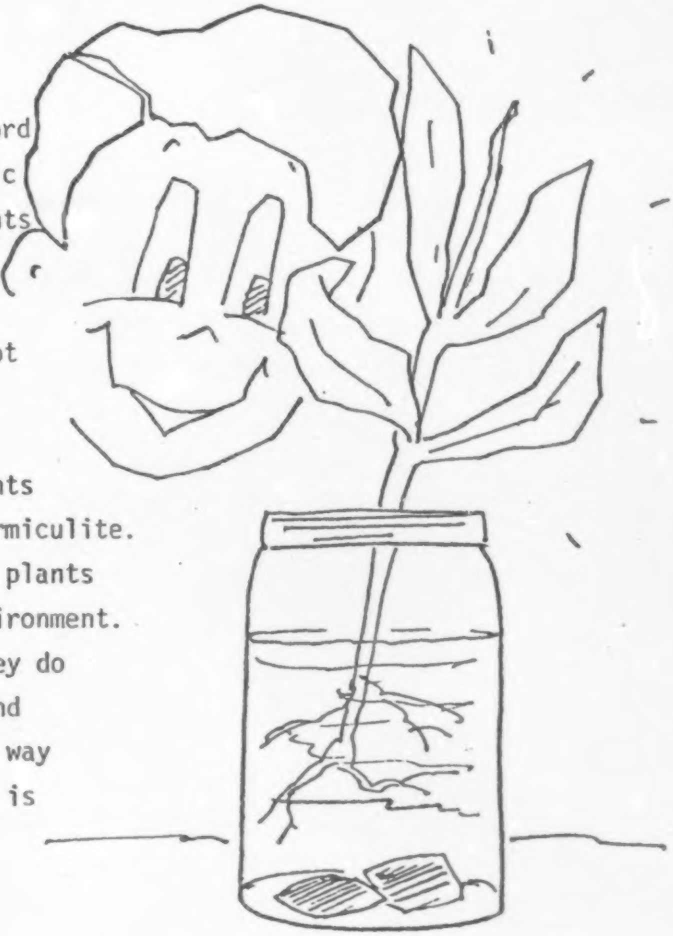
Refined rocks, that is rocks in which some of the minerals have been removed, are used to make concrete and cement, dishes and glass. Dentists even use crushed up rock, which is called pumice, to clean your teeth.

Metals are made from rocks that have been "cooked" to remove different metal ores such as iron, copper, silver, gold, and aluminum.

In the picture below, put an X on all the things that could be made from rocks.



Name ______________________________



WHAT IS HYDROPONIC GARDENING?

Hydroponics comes from the Greek word that means 'water'. At first, hydroponic gardening was the method of growing plants in water without soil. But, scientists found that growing plants in just water caused some problems. The plants did not get enough air and the plant roots had nothing to hold on to.

Now, hydroponic gardeners grow plants in materials such as sand, gravel or vermiculite.

Gardeners like this way of growing plants because they can control the plants environment. Plants can be grown anywhere because they do not use soil. The plants grow faster and produce more food. Growing plants this way also saves water because the same water is used over and over again.

Draw a circle around the right words.

1. Hydroponic gardening is growing plants without ________. water soil sun
2. This method of gardening saves _________. water sunlight paper
3. Hydroponic gardening makes plants grow _________. slower greener faster
4. Plants grown this way can produce more ________. bugs food pollution

Try this.

Be a hydroponic gardener. You will need a jar, water, a few bits of charcoal (the kind you put in fish tanks), and a small cutting from a plant.

Fill the jar half full with water. Put a few pieces of charcoal in the jar to keep the water clean. Remove any leaves from your plant cutting that would be under the water. Put the cutting in the jar. Place the jar in a spot where the plant will get light but not bright sunlight. Watch for roots to grow.

Try different kinds of plants to see which ones grow best.

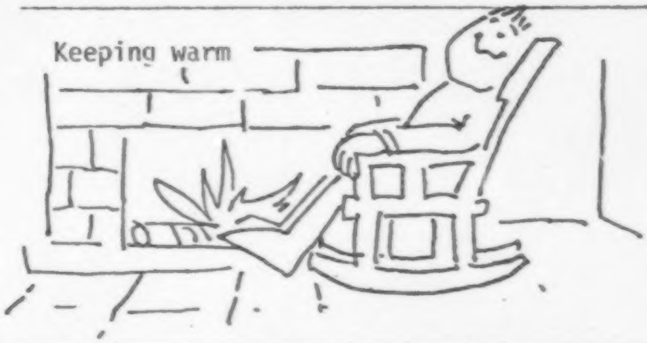
Name ______________________________

Early Uses of Natural Resources

Before the discovery of oil and natural gas, the early Californians used many of their natural resources for cooking, to provide light, and to keep warm.

Use the list below to write the names of natural resources you think might have been used for each purpose. Add other things you can think of. Remember, there is no electricity yet.

wood	whale oil	bees wax	buffalo chips
dried sod	rocks	tree pitch	tallow from cattle

Purpose	Fuels
Keeping warm 	
For cooking	
For lighting	

Name ______________________________

San Francisco Bay

One reason the San Francisco Bay is an important natural resource is that it helps to control the climate. The large body of water keeps the temperature of the surrounding areas from getting too hot or too cold.

Much of the sun's heat energy is absorbed by the bay water. As the water evaporates, it draws heat from the surrounding land. When the land gets cooler than the water, the air absorbs the heat back from the water.

Also, warm air causes winds. The temperature differences of the land and the water keep it nice and breezy.

Complete the following sentences.

1. San Francisco Bay is an important natural ______________________________.

2. The Bay helps to control the ______________________________.

3. Warm air causes ______________________________.

This answer is not in the story, but see if you can write the answer.

4. An even bigger body of water that keeps the San Francisco area cool is

   the ______________________________ ______________________________.

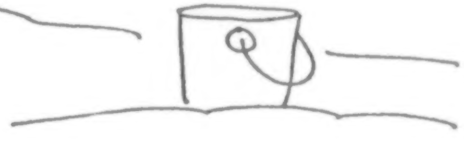
Try this.

You'll need 2 small jars, 2 thermometers, some sand and some water.

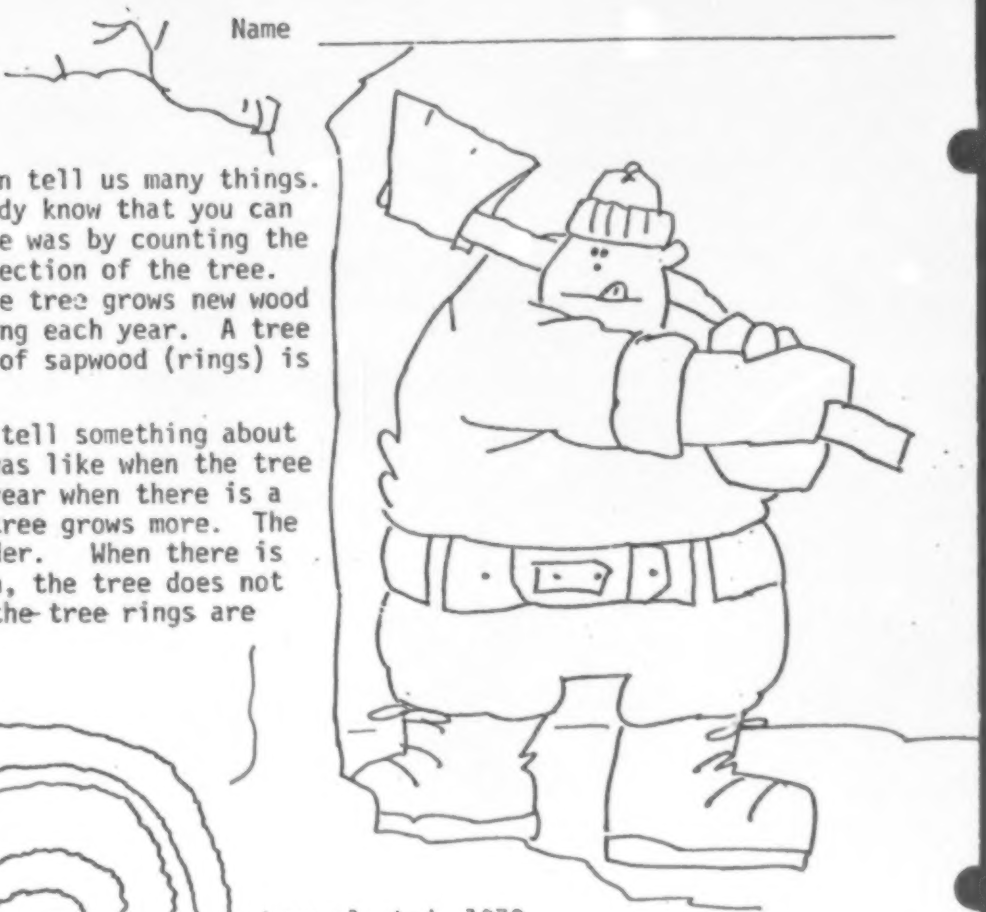
Fill one jar with sand and the other with water. Put a thermometer in each jar. Place the jars on a sunny window sill or outside in the sunshine.

Watch the thermometers.

Which one gets hotter?



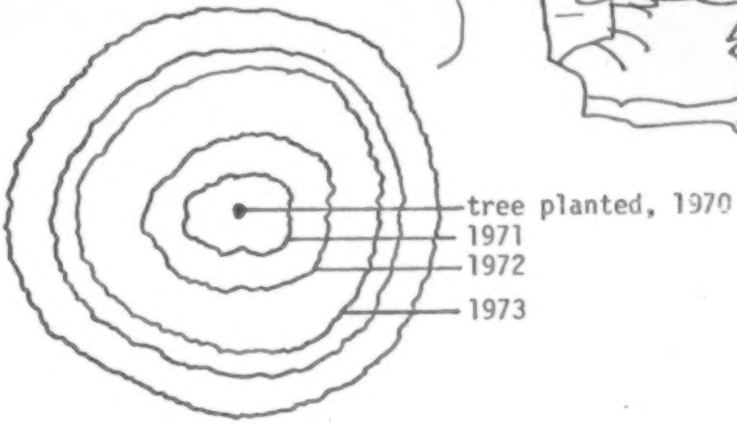
Name ______________________________



Tree Rings

Tree rings can tell us many things. You probably already know that you can tell how old a tree was by counting the rings in a cross section of the tree. This is because the tree grows new wood and makes a new ring each year. A tree with nine circles of sapwood (rings) is nine years old.

You can also tell something about what the weather was like when the tree was alive. In a year when there is a lot of rain, the tree grows more. The tree rings are wider. When there is only a little rain, the tree does not grow as much and the tree rings are closer together.



DIRECTIONS: Use the cross section above to answer the questions.

1. During what year was this tree cut down? ______________
2. How old was the tree when it was cut? ______________
3. Between what years was there a lot of rain? ____________ and ____________
4. Between what years was there just a little rain? __________ and __________

* Some gaint sequoias have more than 3,500 rings. Were these trees living before America was discovered? ______________

Name ______________________________

DIRECTIONS: Read the story. Answer the questions.

WHAT IS SMOG?

The word 'smog' comes from two other words - smoke and fog. Air that is filled with smoke and fog is called smog.

Our air always has some dust, dirt, and other things floating around in it. In cities, there is more dirt and dust in the air. Soot and smoke from factories and gases from cars and trucks make the air dirty. When the air gets dirty, we say it is polluted.

On a windy day, the moving air can blow the polluted air away. When there is no wind, the polluted air hangs like a blanket over the cities. Water drops form around the dust and dirt in the air. This makes the air look brown and dark. This is the smog you can see.

If you breathe this polluted air for a long time, it can hurt your lungs and make you sick. Smog is the worst kind of air pollution.

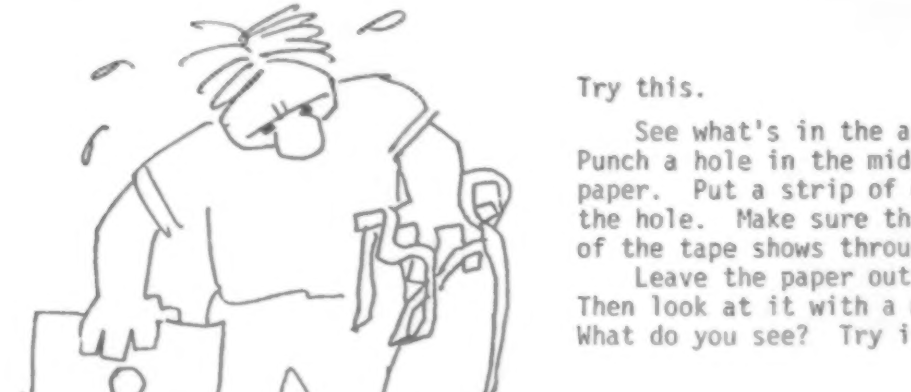
Complete the sentences.

1. Air that is filled with smoke and fog is called ____________________.

2. Smog is air that has __________________ and _______________ in it.

3. When the air gets dirty, we say it is ____________________________________.

4. Polluted air can make you ________________________.



Try this.

See what's in the air around you. Punch a hole in the middle of a piece of paper. Put a strip of clear tape under the hole. Make sure that the sticky side of the tape shows through the hole.

Leave the paper outside for two days. Then look at it with a magnifying glass. What do you see? Try it in different places.

Name ______________________________

Renewable Resources

Years ago there were not as many people as there are today. People did not worry about running out of things. If some trees were cut down for wood or fuel, others began to grow. If some animals were killed for food, others were born. Things that were used were replaced by new living things. For this reason, plants and animals are called 'renewable resources'.

Air is also a renewable resource. Plants and animals recycle the air. The plants give off oxygen which is the part of the air that animals need to breathe. Animals, in turn, give off carbon dioxide that plants need.

The other renewable resource is soil. But it takes a long, long time for decaying plants and animals to become soil. We need to take care of the soil.

Nonrenewable resources are things which cannot be replaced. Once they are used they are gone forever. There is a limited amount of these materials on the earth.

Ores, from which metals are made, and minerals that come from the rocks and earth, are nonrenewable resources. Fossil fuels, coal, oil, and natural gas, are also nonrenewable resources. When we use up what there is, there will be no more.

DIRECTIONS: On the space in front of each item below, put a '1' if it is made from a renewable resource. If the item is made from a nonrenewable resource put a '2'.

____ rollerskates

____ lumber

____ knives, forks and spoons

____ cars

____ movie film

____ breakfast cereals

____ paper

____ tv sets

____ wool shirts

____ plastic pots

____ alarm clocks

____ frisbees

____ zippers

____ fishing reels

____ cardboard

____ stoves

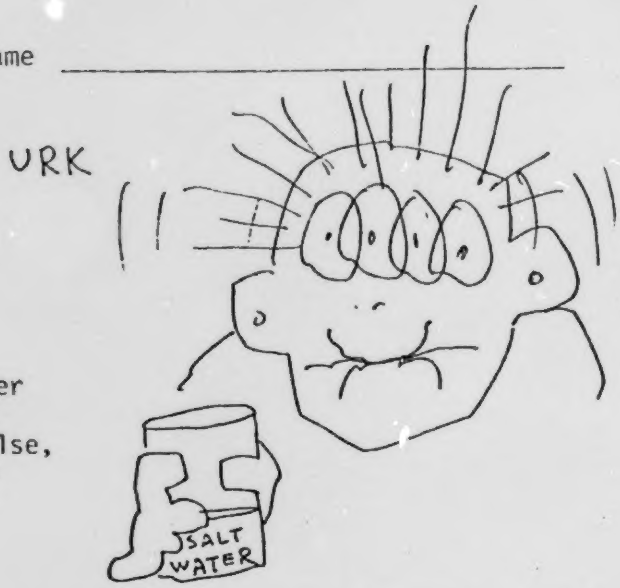
____ glasses

____ bicycles

Name ____________________

Follow the directions.

The right answers will tell you where much of our salt comes from.



DIRECTIONS: Read the statement. If you think the statement is true, put the letter in the true column on the space in the answer. If you think the statement is false, put the letter in the false column on the answer space.

For space number:	Statement	True	False
4	People cannot live without salt.	F	P
12	Salt is good for plants.	E	O
3 and 7	Salt is a natural mineral.	N	T
15	Rain and snow dissolve the salt in rocks and carry it to the ocean.	Y	A
9	When water evaporates, it leaves the salt behind.	I	M
8 and 11	Drinking salt water is good for you.	H	C
5	Salt will not dissolve in water.	O	R
13	The oceans are getting saltier.	B	E
2, 6 and 14	Too much salt can kill you.	A	W
1 and 10	No fish can live in salt water.	F	S

AN IMPORTANT SOURCE OF SALT IS . . .

__ __ __   __ __ __ __ __ __ __ __ __   __ __ __

1 2 3   4 5 6 7 8 9 10 11 12   13 14 15

Name ______________________________

Metals

Metal comes from ores which are mined from the ground. The ore is crushed and refined to produce pure metal. Gold and silver are two important metals found in California. Other important metals found in the United States are copper, aluminum, uranium, nickel, tin, lead, and especially iron. Iron and steel, which is made from iron, are very useful to us.

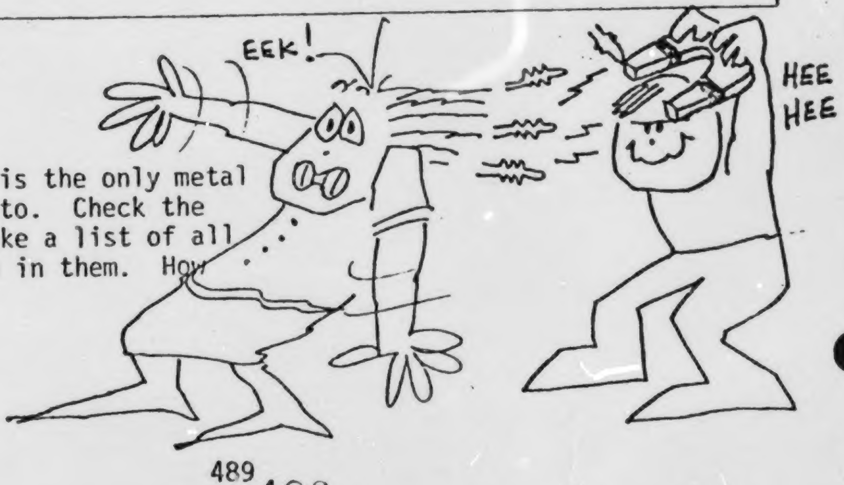
DIRECTIONS: Here are the names of some things we use. Many are made totally or partly from metal. Some have no metal at all. Put each word in the list under the correct heading to show how much metal is in each item.

car paper faucet scissors binder clock
book pencil needle TV antenna stockings rug
keys light bulbs applesauce

All Metal	Partly Metal	No Metal
______________	______________	______________
______________	______________	______________
______________	______________	______________
______________	______________	______________
______________	______________	______________

Try this.

Find a magnet. Iron is the only metal that a magnet will stick to. Check the things in your house. Make a list of all the things that have iron in them. How will you know?



RELATED ACTIVITIES

The following pages are ideas for integrating conservation activities with areas of the curriculum other than language arts, math, social studies and science. These activities are samples of those included in the 'All Levels' Guide which is the seventh book of the Conservation For Children series.

The 'All Levels' Guide contains activities and ideas for art, music, growing plants, and classroom projects, as well as student and teacher bibliographies. The activities and ideas are applicable to many grade levels.

GARDEN MARKERS

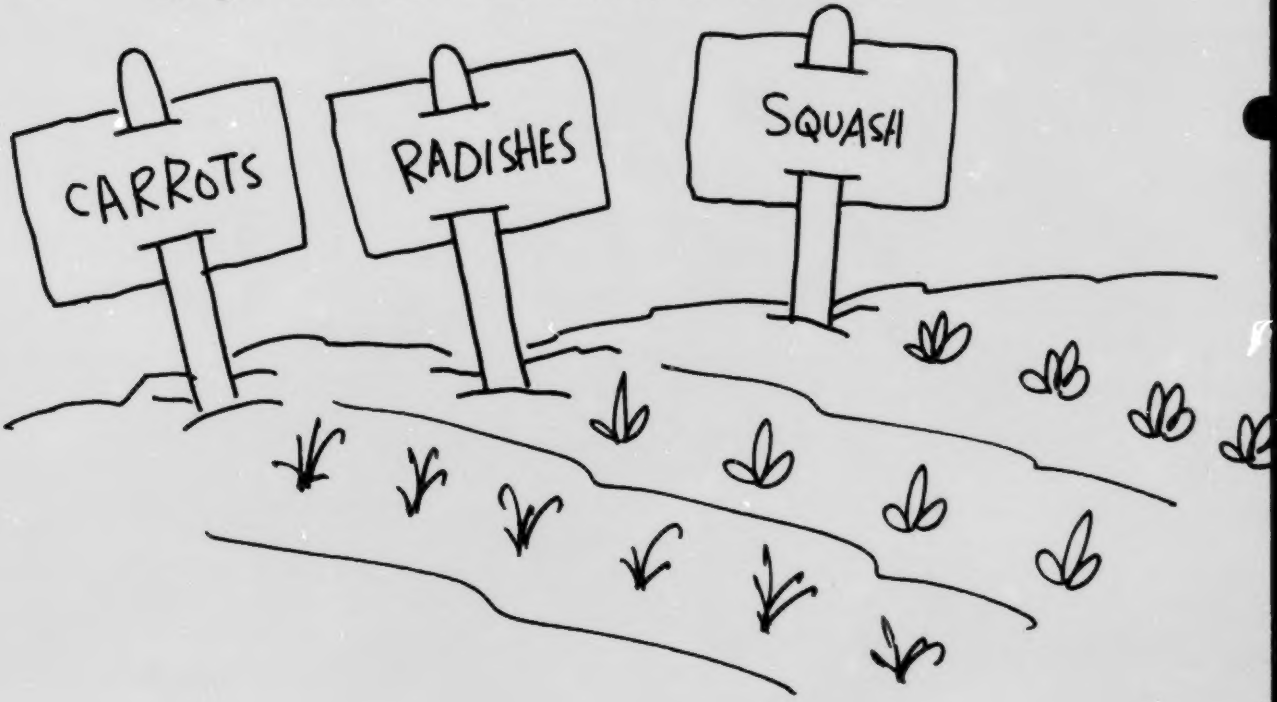
You can recycle plastic meat trays into garden markers that will not fade away at the first rain or watering.

Materials needed:

plastic-foam meat trays, waterproof markers, popsicle sticks

Directions:

Cut the plastic-foam meat trays into rectangles about 2 inches by 4 inches. Use a waterproof marker to write the name of each vegetable and flower you want to mark. You can draw pictures of the plants, too. Cut a small slit near the top center and bottom center of each rectangle. Slide a popsicle stick through the slits. Now your markers are ready to place in your garden.



Potpourri or Fragrance Jars

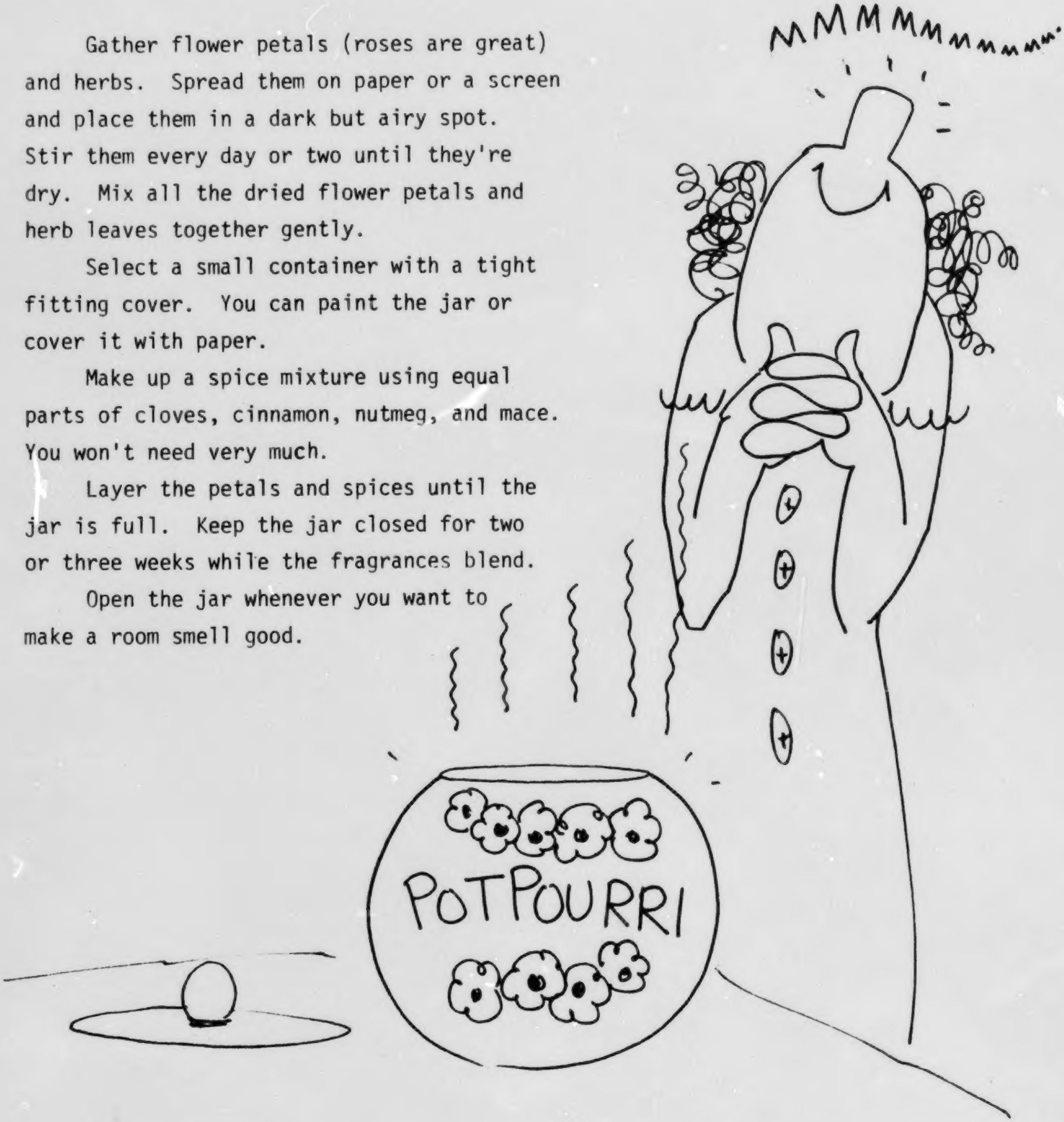
Gather flower petals (roses are great) and herbs. Spread them on paper or a screen and place them in a dark but airy spot. Stir them every day or two until they're dry. Mix all the dried flower petals and herb leaves together gently.

Select a small container with a tight fitting cover. You can paint the jar or cover it with paper.

Make up a spice mixture using equal parts of cloves, cinnamon, nutmeg, and mace. You won't need very much.

Layer the petals and spices until the jar is full. Keep the jar closed for two or three weeks while the fragrances blend.

Open the jar whenever you want to make a room smell good.



Kitty Toy

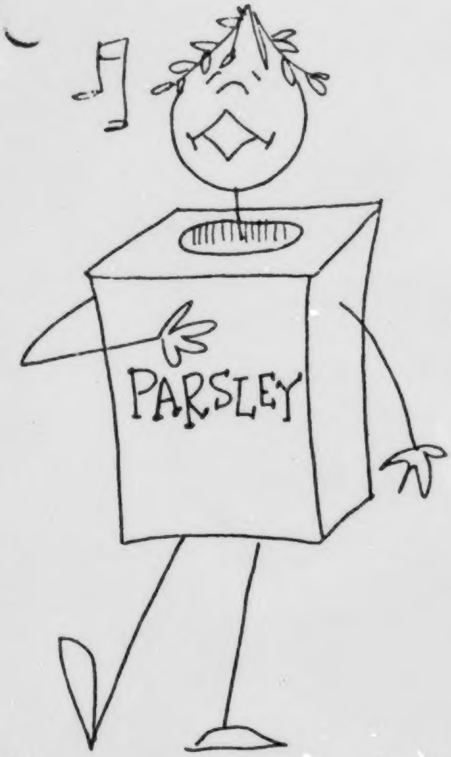
With a little growing and a little sewing you can make a fun toy for your favorite cat.

Catnip is a herb that grows easily from seed. Follow the directions on a seed package to grow some catnip. When the plant is 1½ to 2 feet high, break off several pieces and hang them upside down in a cool, airy place to dry. When the leaves are dry, strip them from the branch and gently crush them. This is the stuffing you your kitty's toy.

Choose a strong piece of scrap material (old jeans are good) and cut two pieces in the shape you want. Sew the two pieces together with tiny strong stitches on three sides. Stuff the toy with the catnip and sew the fourth side.

KITTY - KITTY

This idea is from a book called Growing Up Green by Alice Skelsey and Gloria Huckaby. It has lots of fun things to do with growing plants.



HERBS

Herbs (usually pronounced 'erbs') have been used by people for thousands of years. The leaves and stems of herbs are still used for medicines, seasonings, food, perfume, and even disinfectants.

Growing herbs can provide materials for a wide variety of classroom projects. Herbs,such as anise, mint, garlic, and sage,can be part of a 'smell and tell' collection. Children can identify the herb that smells like chewing gum (spearmint and peppermint), the licorice one (anise), and the herb that reminds them of Thanksgiving dinner (sage).

Other herbs, such as lavender and lemon balm, are good for making potpourri balls or sachets.

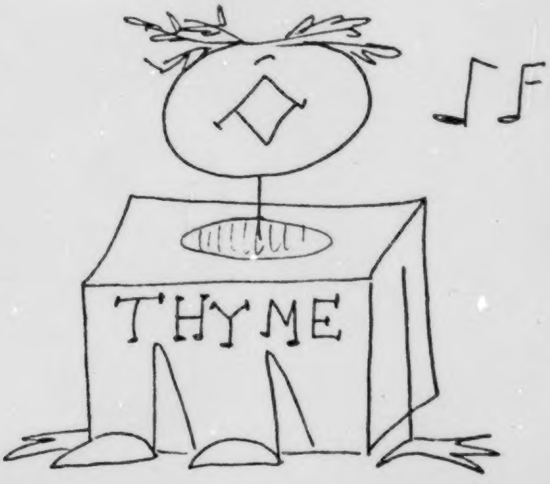
Growing catnip offers the opportunity of making a toy for a favorite kitty.

Herbs can be purchased in small pots from the nursery or can be grown in the classroom from seeds. They like soils that are loose (part sand and peat moss) and have good drainage. Most herbs like sun so be sure to keep them in a location with good light.

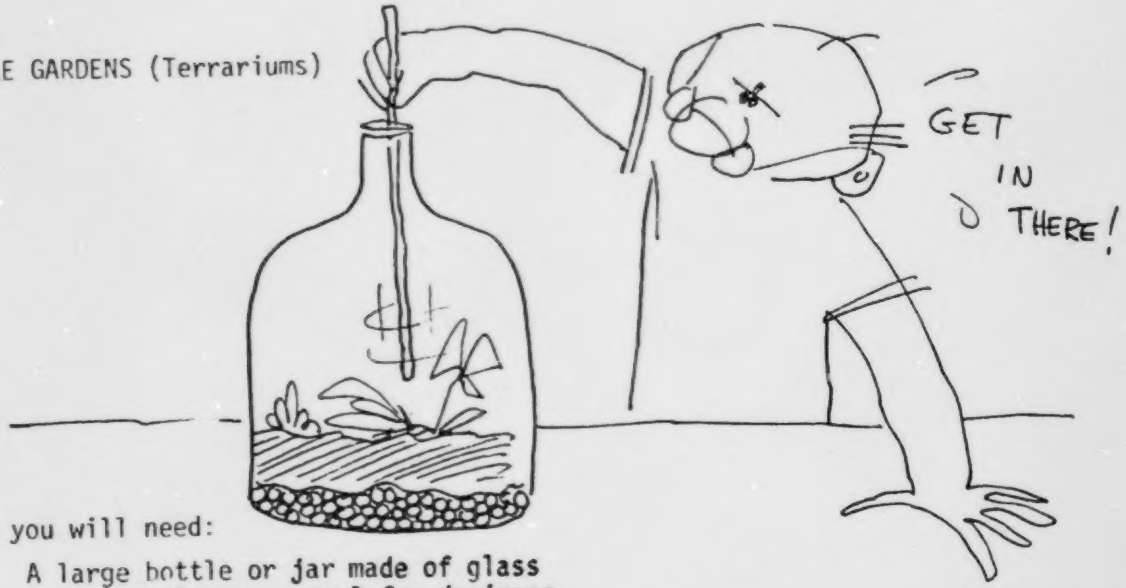
Some easy growing herbs for the classroom are anise, basil, catnip, dill, garlic, lavender, mint, lemon balm, oregano, and, of course, parsley, sage, rosemary, and thyme.

SAGE
ROSEMARY

Note: Mint grows well in water alone.



BOTTLE GARDENS (Terrariums)



What you will need:

A large bottle or jar made of glass
Small pebbles or gravel for drainage
Planter mix
A few pieces of activated charcoal (the kind used for aquariums)
Small plants or plant cuttings
A long stick (chopsticks work well)

What to do:

1. Wash the bottle or jar well. Remove the label if there is one.
2. Put a layer of clean pebbles or gravel in the jar for drainage.
3. Carefully add the planting mix to fill about 1/4 of the jar. Add the charcoal to the planting mix to keep the soil sweet.
4. Use the long stick to make little holes in the soil. Plant the plants or cuttings in the holes and gently tamp the soil around them.
5. Sprinkle a little water into the jar. Bottle gardens do not need to be watered often as there is little evaporation.
6. Keep the garden in a light place but not in direct sunshine.

(You can make a good 'tamping' tool by wrapping a small piece of cloth around the end of the stick and securing it with a rubber band.)

Learn the song "It's A Small World" by Sherman and Sherman, Walt Disney, Inc.

Then sing these additional verses by Mary Hallesy and the 1976 LeConte Lodge Summer Staff.

1. There is just so much water and so much air
   And just so much land and food everywhere
   There's so much we must share, oh it's time we're aware
   It's a small world after all. (Chorus)

2. So many people using up so much so fast
   We cannot go on as we've done in the past
   It is time to confess we have got to USE LESS
   It's a small world after all. (Chorus)

3. On this spaceship earth we are all a crew
   And we've got to learn what we must do
   It is time we're aware we use more than our share
   It's a small world after all!!! (Chorus)

Reprinted by permission, Hidden Villa Inc.
Drawer AH
Los Altos, California

Many people are working together to keep our environment clean and healthy for all living things. They will send you information that tells how you can help.

Remember, it takes energy and natural resources to make these materials, so onl send for the things you really want to know more about.

Things to Send For ....

Mr. Peanut's Guide to Ecology

This is a 22 page booklet that tells about our 'spaceship earth'. It has lots of ideas on how we can conserve our natural resources.

Write to: Standard Brands Educational Service
Box 2695
Grand Central Station
New York, N.Y. 10017

It's free.

Once There Lived a Wicked Dragon

This is the story of our growing pollution problem and what you can do about it.

Write to: Solid Waste Information Materials Control Section
U.S. Governmental Protection Agency
Cincinnati, Ohio 45268

Ask for booklet No. SW 105.1. It's free.

Energy Activities with Energy Ant

Here's a way to find out about the history of energy from dinosaur days to moder solar heated houses. The activities included dot to dots, crossword puzzles, and oth fun things to do.

Write to: Federal Energy Administration
Office of Communications and Public Affairs
Washington, D.C. 20461

It's free.

Environmental Bingo Game

This is a new way to play Bingo and learn about environmental problems and solutions, too.

Write to: Conservation Committee
Garden Club of America
598 Madison Ave.
New York, N.Y. 10022

Send 10¢ for postage and handling charges.

Here are some other things to send for. These materials will give you information about energy and our natural resources.

The Story of Oil

This is a large poster that shows the development of oil.

Write to: Corporate Communications
Union Oil Company
Box 7600
Los Angeles, California 90051

It's free.

Solar Science Projects

This booklet includes directions for making seven solar projects, including a cooker, water heater and radio. It was written by D.S. Halacy, Jr.

Write to: Scholastic Book Services
50 W. 44th St.
New York, N.Y. 10036

Send 75¢.

Earthbeats Newspaper No. 1 on Energy

This newspaper has many articles on alternative fuel sources and how they are being used in different parts of the world.

Write to: Sea Grant College Program
University of Wisconsin
1800 University Ave.
Madison, Wisconsin 53706

It's free.

You and Your Electric Company

Here is a 36 page booklet that has hundreds of facts about electricity and many ideas on how you can save electricity at home.

Write to: Edison Electric Institute
90 Park Ave.
New York, N.Y. 10016

It's free.

STUDENT BIBLIOGRAPHY

Here are some good books to read about conservation and pollution problems. Some may be in your school library. The others can be found in public libraries and book stores.

1. The Giving Tree, Shel Silverstein, Harper and Row Co., N.Y.
   This is a wonderful story about the relationship between a tree and a man.
2. The Lorax, Dr. Seuss, Random House, N.Y.
   The Once-ler describes the results of the local pollution problem.
3. Sparrows Don't Drop Candy Wrappers, Margaret Gabel, Dodd, Mead and Co.
   Ways to help the environment are included in this book.
4. The Wump World, Bill Peet, Houghton Mifflin Co.,
   An easy to read book about the dangers of pollution.
5. Let Them Live, Dorothy P. Lathrop, The Macmillan Co., N.Y.
   A book about the problems facing endangered animals.
6. The Only Earth We Have, Lawrence Pringle, The Macmillan Co., N.Y.
   Problems and solutions for taking care of the planet Earth.
7. About Saving Wildlife for Tomorrow, Solveig Paulson Russell, Melmont Publishers
   Chicago, Illinois
   Includes suggestions for change that will help plants and animals.
8. Every Day is Earth Day, Illa Podendorf, Childrens Press, Chicago, Illinois
   Conservation ideas that you can do now.

Add the titles of other books about conservation.

9.

10.

11.

12.

Name ______________________

DIRECTIONS: Use the words in the box to fill in the blank spaces in the story below. Read the story again to be sure it makes sense.

decay plants environment protect
oxygen dependent food remember

Ecology is the study of the relationship of living things to their environment and to each other. We share our environment, the earth, with all living things, both plants and animals. We are dependent on each other.

For example, plants add oxygen to the air for us to breathe. We, in turn, breathe out carbon dioxide which the plants need. Also, as dead plants decay, they make the soil richer for growing new plants. Many animals, including man, use these plants for food.

We should remember that all plants and animals need the earth's air, water, and land to live. Because we are dependent on each other, we must protect the land, air, and water that we share.

Name ______________________

DIRECTIONS: Read the story. Draw a line under the best answers to the questions.

Every now and then something happens that shows how man's carelessness can affect other animals in his environment. The animal in this true story was a Risso dolphin, normally found only in mid-ocean.

People at Marineland, a zoo for sea life just south of Los Angeles, began receiving calls reporting that a dolphin, that seemed to be hurt, was seen in San Pedro Harbor. It is against the law to collect dolphins near shore unless they are ill and attempt to beach themselves. The dolphin finally did so and was rescued by the Marineland crew. The dolphin had two main problems - he couldn't swim and he wouldn't eat. The trainers at Marineland patiently tried feeding him and swimming with him in a small tank at the zoo.

At first he began to get better and the trainers had high hopes. But then, 10 days after he had been picked up on the beach, the dolphin died. He had not been able to eat. An examination was held, and inside the dolphin were found 20 to 25 giant 30-gallon plastic trash bags, two plastic 6-pack beer holders, and about 25 feet of plastic twine. In all, there were eight pounds of plastic litter inside the dolphin.

1. A good title for this story would be:

   It's Fun to Go to the Seashore
   Litter Harms Animals
   Man Should Not Feed Plastic to Animals

2. The dolphin was first seen:

   swimming in San Pedro Harbor.
   at Marineland.
   in mid-ocean.

3. The Marineland crew tried to:

   train the dolphin to do tricks.
   remove the plastic litter.
   get the dolphin to eat and swim.

4. It is against the law to:

   feed dolphins.
   catch dolphins in the water near shore.
   help them when they are sick.

5. The dolphin died because:

   he swam too far from his home.
   he was old.
   he ate litter left by people.

Name ______________________

Directions: Read the story. Draw a line through the sentences that do not belong in the story.

Litter on the Beach

We see all kinds of litter on the beach. The cans, bottles and papers that have been left by people are ugly to look at. ~~We like to swim in July.~~

Some beach litter is made of metal. ~~When it rains, the rivers and lakes fill up again.~~ These metal things often have sharp edges which can harm people and wildlife.

Some metals are worse than others. Metals that rust contain iron. ~~Car exhaust is a major source of air pollution~~. You can tell if the metal is iron because it will stick to a magnet. Iron comes from the earth. ~~Trees provide us with wood to build houses.~~ Iron will keep rusting until it is part of the earth again.

~~Sunday is the first day of the week~~. Some cans are made of aluminum. Aluminum will not rust. A magnet will not stick to it. These cans will never break down and become part of the earth again.

Both kinds of metal litter are bad. ~~We have trash cans in our classrooms at school~~. It takes a long time for cans made of iron to rust. But aluminum cans will litter our beaches forever unless they are picked up.

Name ______________________

DIRECTIONS: Use the words in the box to fill in the blanks in the story. Read the story again to answer the questions at the bottom of the page.

problems shrunk dams deep dumping
coast flow originally life dirt

SAN FRANCISCO BAY

The San Francisco Bay is the largest bay on the coast of California. The Bay originally had a surface area of 680 square miles. But by 1969, the Bay had shrunk to 400 square miles. This was caused by dumping dirt and garbage along the shores. Also, many dams were built on rivers which flow into the Bay. The flow of water into the Bay became less. Silt, a fine powdered dirt, began collecting on the bottom of the Bay. Now the Bay is not as deep or as big as it once was. This change has affected plant and animal life as well as recreation for people. We need to solve these problems to save San Francisco Bay.

Answer the following questions.

Is San Francisco Bay the same size today as it was in the past? no

What has been dumped along the shores? dirt and garbage

What is collecting on the bottom of the bay? silt

What has lessened the flow of water into the bay? dams

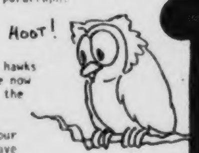
Name ______________________

DIRECTIONS: Here are some ways that man affects his environment.
Write 'helps' in front of the sentences that make our environment better.
Write 'hurts' in front of the sentences that harm our environment.

helps 1. Young trees are being planted as old trees are cut down.
hurts 2. Fumes from cars and factories are putting poisons into the air.
helps 3. Scientists are working to find new ways to kill insects.
hurts 4. Some factories are pouring used, dirty water back into streams and rivers.
hurts 5. Forests are being cut down to make more land for more houses.
helps 6. City planners are saving open land spaces for parks.
helps 7. Many people are riding buses or bicycles.
hurts 8. Pesticides are sprayed on crops to kill insects.
helps 9. Streams and rivers are being restocked with fish.
helps 10. Litter laws remind people to keep their environment clean.

Name ______________________

DIRECTIONS: Read the story. At the bottom of the page, underline the best sentence that tells the main idea of each paragraph.



Birds of Prey

(1) America's birds of prey, such as eagles, hawks and owls, are in trouble. Several species are now "endangered". There are three main causes of the trouble.

(2) Pesticides have been sprayed on many of our farm crops. Some of these chemical poisons have passed through nature's food chain and ended up in birds' bodies. This has caused some birds to stop laying eggs. Other birds lay eggs with shells so thin that the eggs break when the parent bird sits on them.

(3) Thoughtless people have also killed many adult birds or destroyed their nests. These people often thought that the birds were pests and that they were eating the crops. But, birds of prey are really the farmers' friends. They eat mice, rabbits, and other small animals that can destroy crops.

(4) People have also destroyed the birds' habitats. They have built houses, factories and highways where the birds live. They have also dug mines, cut forests and plowed the lands where the birds naturally nest and hunt.

Birds of prey are important to the balance of nature.
We all need to work together to protect these birds.

Paragraph 1
- A. Eagles are birds of prey.
- B. Many birds of prey are in trouble.
- C. Parrots are an endangered species.

Paragraph 2
- A. Some birds lay thin-shelled eggs.
- B. DDT is a pesticide.
- C. Pesticides are dangerous to birds.

Paragraph 3
- A. Many birds are killed by people.
- B. Birds eat mice and rabbits.
- C. Farmers grow many crops.

Paragraph 4
- A. People cut down forests for timber.
- B. Birds don't like factories.
- C. Many bird habitats have been destroyed by people.

Name ______________________

Man has polluted his environment in many different ways.

Put numbers in front of each set of sentences to show the order in which they happen.

2 Man began spraying poison on the crops to kill the insects.
1. Insects ate much of man's crops.
3 Poisons also killed birds and other animals that ate the insects.

3 The animals that live in the streams and rivers began to get sick and die.
2 Some factories pour used, dirty water back into the streams and rivers.
1 Factories were built to make more things for people.

1 People made more and more cars.
2 Fumes from cars put poisons into the air.
3 Trees and plants in the cities began to get sick and die.

3 Litter is not nice to look at and can hurt animals.
2 More people made more litter.
1 There are many more people on the earth today.

Name ______________________

ENDANGERED ANIMALS

Many animals are in danger of becoming extinct. Extinct means that there are not (and never will be) any more of those animals. Dinosaurs are extinct animals.

Animals become endangered for many reasons. Some die because people have moved into places where they live. Then the animals have no place to find food or build their homes. Others are killed for their fur or skins to make coats and other clothing. Some animals are killed because people are afraid of them. Some are killed for sport by hunters.

Here are a few of the animals that are endangered. Draw a line from the animal to the reason you think it might be endangered.

CHEETAH
TIMBER WOLVES
PINE BARRENS TREE FROG
ELEPHANTS
PELICANS

This animal is killed by farmers to protect their herds of cattle and sheep.
People have cut down the trees where this animal makes its home
This animal is hunted for its beautiful fur. The fur is used to make coats.
These animals have been killed by eating poison that farmers spray on crops to kill insects. Fish eat plants that have the poison in them and then these animals eat the fish.
People have moved into places where these animals live. They need a place of their own.

Answers 414, 415, 416, 417

Name ______________________

Recycling Newspapers

Old newspapers can be recycled. That means they can be used again instead of being thrown away or burned. You should save your old newspapers and take them to a paper mill. Paper mills will pay you money for bringing in old newspapers.

The paper mills have their own ways of making the old newspapers into new paper. They soak the newspaers with water and beat the pulp with paddles. Then the wet pulp is put through heated drying rollers. These rollers squeeze the water out of the pulp and dry it into new paper and cardboard.

When we use paper which has been recycled, we are saving trees. It takes about seventeen trees to make one ton (2,000 pounds) of paper.

DIRECTIONS: Answer the questions.

1. What can you do with old newspapers besides throwing them away, making paper hats, or burning them?
   You can recycle them
2. What does recycle mean?
   to use again
3. When the paper mills make paper from trees, they use wood chips from trees and cook them with water to make pulp. To make recycled paper, what do the paper mills mix with water to get pulp?
   old newspapers
4. How many trees does it take to make one ton of paper?
   17
5. What do you think is one of the most important reasons for recycling newspapers?
   saves trees

Name ______________________

Directions: Read the story. Below the story are some new words. Draw a line from the word to its meaning.

Endangered Animals

Many animals are close to extinction today. There are many reasons why this is so. Some animals have decreased in number for hundreds of years due to changes in climate and vegetation. For example, the giant panda and the whooping crane are both rare probably for these reasons. Other animals such as the North American bison and the tiger are rare because of senseless and destructive hunting. Probably most endangered animals are threatened because of man moving into the places in which they live.

For example, when the first settlers were moving across America's "Wild West", the herds of bison (or buffalo, as they are sometimes called) seemed limitless. There were probably sixty million bison roaming the plains in herds that often had several thousand animals. As the settlers spread across the prairies, so the hunters went ahead. Sometimes they were employed to supply meat for workmen on the railroads, but often the slaughter was far greater than was needed. At that time it seemed that the bison would last forever but by the beginning of this century there were only a few hundred left throughout America. By careful conservation, men has now managed to re-establish several large herds, and in the National Parks of Canada and the U.S.A. these magnificent animals can once more be seen.

decreased	plant life; growing plants
vegetation	never ending
rare	protecting from loss or being used up
senseless	became less
limitless	splendid; grand; wonderful
employed	foolish, stupid
slaughter	unusual, seldom seen or found
conservation	give work and pay
magnificent	killing, butchering

Name ______________________

Here is a page from TV Guild. Use the pige to answer the questions at the botton of this paper.

TV Guild JUNE 25, 1979
7:30 PM to 9:00 PM

⑦ ① SUPERMAN - Cartoon
⑨ HYDROPONIC GARDENING
Flipper shows how to grow plants in water.

8:00 ③ ④ MOVIE - Science Fiction [illegible]
"The Return of the Dinosaurs" A man raises dinosaurs to solve the oil shortage. (1 hr.)
⑤ AS THE WORLD TURNS GRAY - Serial
⑦ ① HAPPY DAYS
Fonzie grows moss on his motorcycle.
8:30 ⑤ ⑩ WOODSY THE OWL - Cartoon
⑦ ① ③ STAR TREK
Captain Kirk searches for a new, clean planet.
④ WHERE DOES ALL THE GARBAGE GO
A visit to a company who is turning garbage into electricity.
9:00 ② ④ ⑤ NEWS
⑦ ① RANGER RICK
The ranger talks about the good and bad parts of forest fires.

1. Write the names of the cartoon programs. Superman
   Woodsy The Owl
2. At what time can you see the NEWS on three channels? 9:00
3. When is the program on HYDROPONIC GARDENING shown? 7:30
4. What kind of a program is AS THE WORLD TURNS GRAY? Serial
5. Are these programs shown in the day or night time? night

Name ______________________

RUMBLE
ROAR
SCREECH
BOOM
BARK

Noise pollution is a serious problem. Sometimes it is hard to hear people talk and, sometimes, even to think because of the noise around us. Loud noises can give people stomach aches and headaches, make their hearts beat faster and even make them tired and angry. Very loud noises can hurt your ears and cause permanent loss of hearing.

We are surrounded by noise every day. Jet planes, honking automobiles, barking dogs, TVs, dishwashers and other machines all add to the noises we hear.

People are trying to fight noise pollution. In 1972 the United States Congress passed the Noise Control Act. This law says that the government must try to get rid of noise whenever it can.

We can do something about noise too. We can try not to shout or yell when we talk. We can turn off TVs and radios when no one is listening. Draperies and carpets help to cut down the noise level. The thick materials absorb the sound so some of it does not reach your ear. We can also try to use fewer machines. Everyone can help solve the noise pollution problem.

Read the story to complete the sentences.

1. Very loud noises can cause permanent loss of hearing.
2. In 1972 Congress passed the Noise Control Act.
3. We should turn off TVs and radios when no one is listening.
4. Thick materials, like carpets and drapes, absorb sound.
5. People are trying to fight noise pollution.

Name

Doyle School
10740 Wunderlich Ave.
Cupertino, CA 95014

Sept. 18, 1979

National Wildlife Federation
1412 16th St., N.W.
Washington, DC 20036

Dear Mr. Smith,

Last Tues. our class was talking about building a wildlife habitat in part of our school playground. We understand that you have a Backyard Wildlife Program which will provide directions. Please send us the information we will need.

Thank you,

The students in Rm. 15

Write the words that have been abbreviated in the letter.

Ave.	Avenue	CA	California
Sept.	September	St.	Street
Mr.	Mister	Tues.	Tuesday
Rm.	Room	N.W.	North West

Name

We know that a 'habitat' is a place where plants and animals naturally live and grow. Every plant and animal has its own special habitat which provides food, water, and shelter.

These habitats are part of even larger areas called 'biomes'. Each biome has a special climate, type of soil, and living conditions which provide habitats for certain plants and animals.

The forest is one biome. Evergreen trees, such as firs, spruce, and pines grow in the forest biome. Animals, like deer, bear, and squirrels, are found here.

The desert is another biome. Lizards, tortoises, and some snakes make their home in this biome. Plants, like the cactus, grow well in the desert.

Other biomes include the grassland, cliffs, ocean, tropical forest, and tundra.

The plants and animals below have been listed in the biome where their habitats are usually found. There is one mistake in each list. Cross out the name of the plant or animal whose habitat is not usually found in that biome.

DESERT BIOME

1. Tortoise
2. Cactus
3. ~~Polar bear~~
4. Camel

OCEAN BIOME

1. Whale
2. ~~Cow~~
3. Seaweed
4. Eel

TUNDRA BIOME

1. Penguin
2. Seal
3. Reindeer
4. ~~Tiger~~

GRASSLAND BIOME

1. ~~Dolphin~~
2. Rabbit
3. Blackbird
4. Rattlesnake

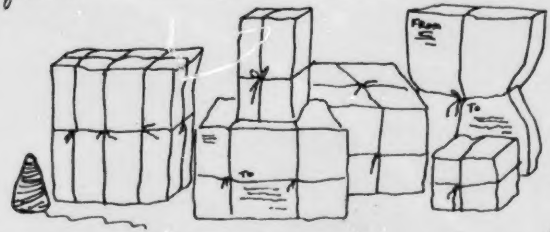
NORTH
SOUTH
EAST
WEST

Name

DIRECTIONS:

Write Yes in front of each group of words that is a sentence.
Write No in front of each group of words that is not a sentence.

yes 1. It takes a lot of energy to make the products we buy.
No 2. Three ways to conserve energy.
yes 3. You should buy things that will last a long time.
yes 4. We don't want to waste the energy that is needed to make products.
no 5. Buying soda in returnable bottles rather than disposable or throw-away bottles.
yes 6. Recycled paper is good to buy.
no 7. We all know that the best way to save energy.
no 8. Extra packaging, such as bulky containers, double boxes and unnecessary plastic.
yes 9. It is wasteful to throw away extra packaging materials.
yes 10. Try to choose things that come in containers you can use again.



Name

DIRECTIONS: Solve the riddle by answering the questions correctly.

RIDDLE: If April showers bring May flowers, what do May flowers bring?

P If hydroponic gardening means growing plants in water, put a P on the line. If not, put a N.
I If polluted air can kill trees and other plants, put I. If not, put O.
L If the wood from trees is used to make glass, put T. If not, put L.
G If trees and plants help to clean the air, put G. If not, put R.
R If conservation means you should never cut down a tree, put I. If not, put R.
I If plants can prevent soil erosion, put I. If not, put G.
M If people could live without plants, put H. If not, put M.
S If plants need water and light to grow, put S. If not, put T.

Name ______________________

DIRECTIONS: Complete the sentences. Use the letters of the answers to solve the riddle.

1. A Greek word meaning water is H Y D R O.
   5 12 9 13 11
2. Some gardeners grow plants in just W A T E R.
   14 4 10 2 13
3. Liquid food and vitamins are added to help the plants G R O W.
   15 13 11 14
4. Bits of charcoal will help to keep the water C L E A R.
   3 6 2 4 13
5. Sometimes pebbles, moss or vermiculite is used to hold the R O O T S.
   13 11 11 10 16
6. This kind of gardening saves water because none is W A S T E D.
   14 4 16 10 2 9
7. This method works well for people who have small B A C K
   1 4 3 8
   Y A R D S.
   17 4 13 9 16
8. We call this hydroponic G A R D E N I N G.
   15 4 13 9 2 18 7 18 15

WHY DID SANTA CLAUS ALWAYS HAVE A GARDEN?

B E C A u S E H E L I K E D T O
1 2 3 4 16 2 5 2 6 7 8 2 9 10 11

H O. H O. H O!
5 11 5 11 5 11

Name ______________________

DIRECTIONS: Read the story. Draw a line from the words below to the right meaning.

City Climate

It is usually hotter in the city than in the country. Do you know why?

In large cities, many machines are used to make, move, heat, or cool things. As these machines use energy, they give off a lot of waste heat. The cities become warmer than the countryside where there are fewer machines.

Also, when people build cities, they replace forests and fields with concrete and asphalt. Concrete and asphalt sidewalks absorb more sunlight and heat than forests and fields do. The sidewalks and buildings give off this heat day and nigh'

These are the two main reasons why the city is usually warmer than the country.

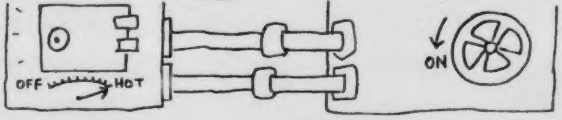
asphalt	the kind of weather a place has
absorb	invented by man to make work easier
machines	used for sidewalks, roofs and roads
forests	take in and hold
climate	left over, not used
waste	large area of land covered with trees

Name ______________________

DIRECTIONS: There is a misspelled word in each sentence below. Circle the word that is spelled incorrectly. Write it correctly on the line at the right of each sentence.

REFUSE-ENERGY SYSTEMS

1. Solid waste can become a valuible fuel. valuable
2. One garbidge can of solid waste has the fuel energy of one gallon of gasoline. garbage
3. We can use solid waste as a substatute for coal and oil fuels. substitute
4. The waste materials can be burned in huge furnuses. furnaces
5. The smoke from the burning can be cleaned so that there will be no air polution. pollution
6. The heet from the fire will boil water to create steam. heat
7. The steam will be pipped to nearby power plants to turn large turbines. piped
8. The turbines will run the generators which produce ellectricity. electricity
9. This is called a refuse-energy sistem. system
10. This method can provide energy and help to get rid of our waste materiuls. materials



Name ______________________

DUMP
HERE I AM
COST TO DUMP: ONE SILVER BULLET
TRASH
TRASH

Solid waste is a big problem in our environment. Unscramble the words to complete each sentence. Write the words on the spaces.

1. Solid waste is another word for BARGGEA. G A R B A G E
   5
2. Sometimes solid waste is piled in open SPUMD. D U M P S
   2 8 7 4
3. Another word for waste materials is SARHT. T R A S H
   1 3
4. Getting rid of solid waste is called POSDALIS. D I S P O S A L
   2 4 6
5. Some companies are burning garbage to make GYEERN. E N E R G Y
   5 5

Use the letters in the numbered spaces to find out

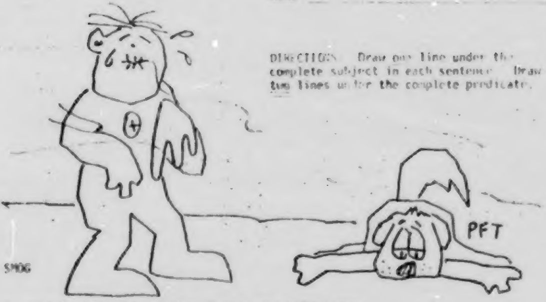
"Where does the Lone Ranger take his trash?"

T O T H E D U M P. T O T H E D U M P.
1 6 1 3 5 2 8 7 4   1 6 1 3 5 2 8 7 4

T O T H E D U M P. D U M P. D U M P . . . .
1 6 1 3 5 2 8 7 4   2 8 7 4   2 8 7 4

(If you don't know this tune, ask your teacher.)

Name ______________________



DIRECTIONS: Draw one line under the complete subject in each sentence. Draw two lines under the complete predicate.

1. Air that is heavy with pollutants is called smog.
2. Smog is a combination of dust and gases that mix with the air.
3. Blowing soil, ocean sprays, volcanic activity, forest fires, automobile exhaust and industrial factories are all causes of smog.
4. In cities, where there are more factories and automobiles, the amount of smog is greater.
5. Smog can hurt your eyes, make you cough, and give you headaches.
6. Animals and plants are affected by smog, too.
7. Many cities are trying to clean their air.
8. Blower fans, filters and water sprays are used by some factories.
9. The factories are trying to lower the amount of dust that escapes into the air.
10 We all need clean air to live.

Name ______________________

DIRECTIONS: Fill in the circle in front of the word that best completes the sentences.

○ walks
1. They are ○ walked to school to save gasoline.
● walking

● turns
2. We ○ turned out lights when they are not needed.
○ turning

○ saves
3. Last year he ● saved ten pounds of newspapers to recycle.
○ saving

○ wastes
4. They are ○ wasted water by letting the faucet drip.
● wasting

● shines
5. The sun ○ shined on the earth and gives us solar energy.
○ shining

○ picks
6. The students in Mrs. Peterson's class are ○ picked up papers on the yard.
● picking

○ kills
7. Man has ● killed many animals for their fur and skins.
○ killing

○ plants
8. We ● planted trees in our yard to give us shade in the summer.
○ planting

● makes
9. Smog ○ maked it hard for plants to grow.
○ making

○ uses
10. Hydro power is ○ used water to make energy.
● using

Name ______________________

Punctuation ! Fill in the correct circles.

○ wont
1. She ● won't throw papers on the ground.
○ wo'nt

○ litterbug,
2. Are you a ○ litterbug.
● litterbug?

○ Mrs
3. ● Mrs. Jones is saving her newspapers to recycle them.
○ mrs

● Woodsy's
4. Do you know ○ Woodsys' song about pollution?
○ Woodsys

○ bottles,
5. We save used ○ bottles. and cans.
● bottles

○ Cupertino. California.
6. There are many recycling centers in ○ Cupertino California.
● Cupertino, California.

● sun,
7. All plants and animals need ○ sun air, and water.
○ sun.

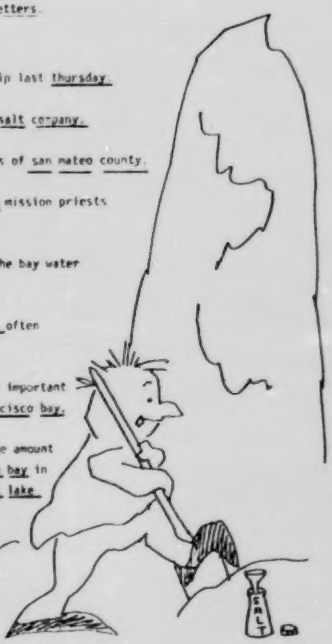
○ natural resources,
8. We need to save our ● natural resources.
○ natural resources

● Stop!
9. ○ Stop, Don't waste that paper.
○ Stop

○ again!
10 Using things ○ again, can save you money.
● again

Name ______________________

DIRECTIONS: Draw a line under the words in each sentence that should begin with capital letters.



1. john and i went on a field trip last thursday.
2. our class went to the leslie salt company.
3. it is located along the shores of san mateo county.
4. did you know that the spanish mission priests started the salt industry?
5. they used windmills to pump the bay water into ponds.
6. miners who came to california often traded gold dust for salt.
7. salt is still one of the most important products we get from san francisco bay.
8. two other places where a large amount of salt is made are san diego bay in california and the great salt lake in utah.

Answers 430, 431, 432, 433

Name ______________________

How Many Syllables?

Put these ecology words in the correct row.

smoke smog dust plastic animals paper
energy pollution litter trees garbage water
recycled habitat . air

One syllable	Two syllables	Three syllables
smoke	plastic	animals
smog	paper	energy
dust	litter	pollution
trees	garbage	recycled
air	water	habitat

Name ______________________

DIRECTIONS: Complete the sentence with the correct word.

1. There are (is) (are) many kinds of pollution.
2. Noise is (is) (are) one kind of pollution.
3. Loud radios, TVs, and vacuum cleaners are (is) (are) things that can cause noise pollution in the home.
4. Water, air, and land are (is) (are) being polluted too.
5. Car exhaust and factories are (is) (are) the biggest cause of air pollution.
6. Our water is (is) (are) being polluted with sewage and detergents.
7. Chemicals and pesticides are (is) (are) other causes of water pollution.
8. Land is (is) (are) being polluted with garbage and other solid wastes.
9. When people leave waste and garbage on the ground, it is (is) (are) called litter.
10. Smog is (is) (are) a kind of air pollution.
11. Keeping our land clean is (is) (are) a job for everybody.
12. Pollution is (is) (are) not very nice to see or smell.

Name ______________________

Find the contraction in each sentence and draw a line under it. Write the contraction and its meaning on the spaces.

1. People shouldn't put nails in trees.
shouldn't should not
2. It's not safe to drink polluted water.
It's It is
3. Solar energy doesn't cost a lot to use.
doesn't does not
4. Endangered animals means there aren't many left.
aren't are not
5. Dumping waste into the water isn't a good idea
isn't is not
6. When we litter, we're polluting the earth.
we're we are
7. We couldn't live without water.
couldn't could not
8. Plastic can't be melted down and used again.
can't can not
9. They're saving cans to recycle.
They're They are
10. There wasn't as much pollution 50 years ago.
wasn't was not

Name ______________________

DIRECTIONS: On the line at the right of each sentence write the adjective that describes the underlined noun.

ADAPTATION

1. The living things that have the greatest chance of survival are the ones that can adapt themselves to their surroundings. living
2. Some plants and animals change their color, body structure, or food habits to survive. body
3. These changes happen over a long period of time. long
4. The cactus is a good example of a plant that has adapted to changing temperatures. changing
5. It can hold large amounts of water for a long time. large
6. This is why it can live in the hot desert where water is scarce. hot
7. Moths that live in smoggy cities have been known to change their color from white to grey. smoggy
8. This color change helps them to better hide from their enemies. color
9. Some animals have developed longer legs for running, sharper claws for digging, or the ability to change colors. sharper
10. You are adaptable if you can change when various things around you change. various

Answers 434, 435, 436, 437

Name ______________________

DIRECTIONS: Draw a line under the compound words you find in the story. Write them on the blank spaces below. Draw a line between the two words that form the compound word.

Many people are working hard to help our environment. They are asking our Congressmen to pass laws to protect our wildlife and prevent pollution.

You may know that you can go to jail or pay a fine if you litter our highways. There are also laws against making too much noise and polluting your neighbor. We have laws requiring licenses for fishing and hunting. The money from these license fees is sometimes used to restock rivers and lakes with fish, to replant trees and shrubs along the roadsides, and to make improvements in parks and campgrounds. Laws also limit lumber companies in the amount of redwood trees that they can cut.

Taking care of our environment is a responsibility for everyone.

congress/men	road/sides
wild/life	camp/grounds
high/ways	red/wood
some/times	every/one

NO DUMPING
TUT
TUT

438

Name ______________________

DIRECTIONS: Correct the story by drawing a circle around the right homonym.

OUR FOREST

When the first settlers came to America, forests covered (too, [✓ two]) thirds of the land. The settlers cut down the trees to make room for ([✓ their], they're) farms. They used the (would, [✓ wood]) to build houses and to burn for fuel.

Soon loggers and farmers were cutting down (hole, [✓ whole]) forests. They often "clear cut" areas of land. This means they used big machines to knock down all the trees. When they were (threw, [✓ through]), the land was ([✓ bare], bear).

([✓ Some], Sum) people said, "We (no, [✓ know]) there will always be more trees." But, they were wrong. Other people began to worry about ([✓ our], hour) forests. They (new, [✓ knew]) that clear cutting of forests could cause floods and destroyed the homes of animals. They helped to get laws passed to protect our forests.

Conserving a forest does (knot, [✓ not]) mean leaving the trees alone, for the forest is a living, renewable resource. It means protecting the forest and using it wisely.

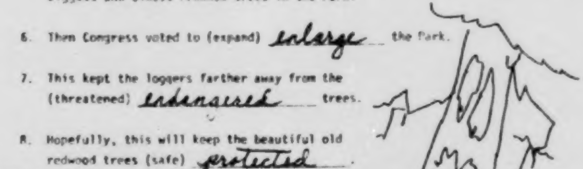
439

Name ______________________

DIRECTIONS: Synonyms are words that have the same, or almost the same, meaning. Use the words below to complete the sentences. Choose the word that has almost the same meaning as the word in parentheses ( ).

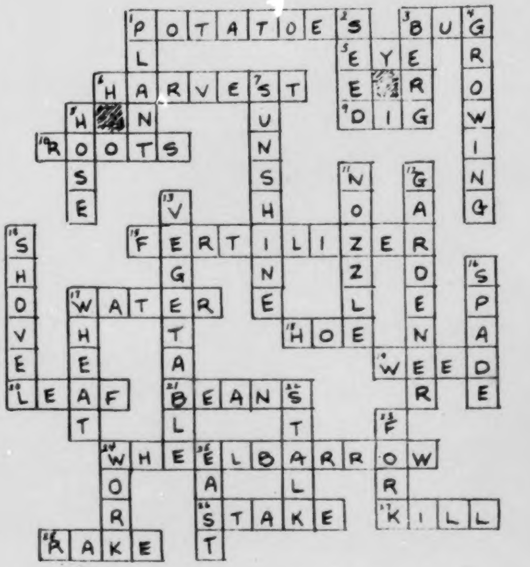
enlarge | damage | endangered | protected
overflow | distress | stripping | soil

1. The trees in Redwood National Park were in (trouble) distress.
2. Lumber companies were (clearcutting) stripping trees from the lands next to the Park.
3. When it rained, (dirt) soil ran off the treeless land and into the Park.
4. The rainwater caused Redwood Creek to (run over) overflow its banks.
5. The flood water began to (hurt) damage the roots of the biggest and oldest redwood trees in the Park.
6. Then Congress voted to (expand) enlarge the Park.
7. This kept the loggers farther away from the (threatened) endangered trees.
8. Hopefully, this will keep the beautiful old redwood trees (safe) protected.



440

Name ______________________ GROWING A GARDEN - 2



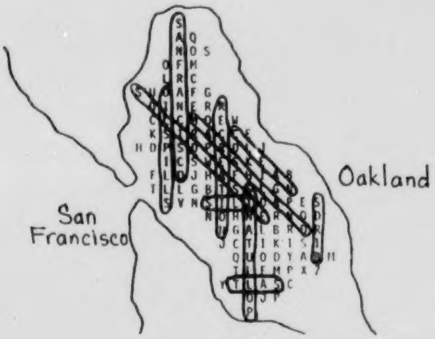
442

Answers 438, 439, 440, 442

Name ______________________

DIRECTIONS: Underline the best word to complete the sentence.
Circle those words in the 'word find'.

1. The Golden Gate Bridge spans the entrance to Monterey [✓ San Francisco] Bay.
2. The wet, grassy area around the Bay is called the [✓ marshland.] channel.
3. An important product we get from the Bay is tuna. [✓ salt.]
4. Boating and fishing are types of Bay [✓ recreation.] habitats.
5. Many bears [✓ birds] make their homes in the marshlands around the Bay.
6. Very fine dirt which is carried by rivers and filling the Bay is [✓ silt.] salt.
7. Chemicals and sewage are spiders [✓ pollutants] that are harming the Bay.
8. Garbage is an example of [✓ solid waste] a good thing that is sometimes dumped in the Bay.
9. Sea otters [✓ Oil spills] are another problem of the Bay.
10. We should all work to keep San Francisco Bay [✓ clean.] wet.



Name ______________________

DIRECTIONS: Read the story. Find the words below in the story and draw a line under them. Write the words in alphabetical order on the spaces below the story.

disappear crocodiles species entire

pandas extinct destruction people

societies continue

Disappearing Animals

Animals are always changing. Just as new ones appear, so others disappear. Some, like the crocodile, have remained the same for millions of years, while others are changing rapidly. In the last few hundred years, man has spread out over the whole world. In doing so, he has killed millions of animals. Some have been killed for food, some because they were pests, some for sport, and some for their furs.

Man has also wiped out entire species of animals. Once a species is extinct, there will never be any more.

More and more people are becoming aware of this and are trying to stop the destruction of wildlife. Societies like the World Wildlife Fund buy reservations where animals can live in peace. Governments protect animals so that their people can enjoy seeing them. Wild animals should be for everyone, not just for a few hunters.

If we want to continue to see leopards, tigers, pandas, crocodiles and other animals, we must make sure that they do not become extinct.

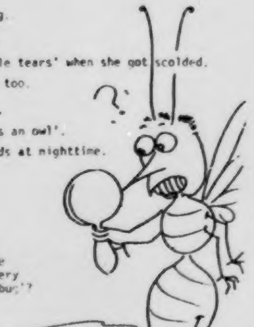
1. continue
2. crocodile
3. destruction
4. disappear
5. entire
6. extinct
7. pandas
8. people
9. societies
10. species

Name ______________________

DIRECTIONS: We often use similies to explain events or describe people and feelings. Beneath each simile below, draw a line under the sentence that best explains what is meant.

1. When the fire broke out, Russ was 'as brave as a lion'.
   - A. [✓ He was very courageous when the fire started.]
   - B. When the fire started, he crawled away.
2. Carolyn and June are 'up to some monkey business'.
   - A. They are starting to sell monkeys.
   - B. [✓ They are doing something foolish.]
3. Janice was 'as busy as a beaver'.
   - A. She was building a dam on a river.
   - B. [✓ She was working very hard.]
4. Before the party started, Ed 'let the cat out of the bag'.
   - A. [✓ He told something that was a secret.]
   - B. He released the cat from the sack.
5. Boy, is that a 'fishy' story!
   - A. The story is about fishing.
   - B. [✓ The story sounds untrue.]
6. You should have seen Gail's 'crocodile tears' when she got scolded.
   - A. Her crocodile was sobbing too.
   - B. [✓ She was crying big tears.]
7. That new boy, Carlton, is 'as wise as an owl'.
   - A. He knows how to catch birds at nighttime.
   - B. [✓ He is very smart.]

These are just a few of the many similes we use that are about animals. Are these true characteristics? What about 'slippery as an eel', 'dumb bunny', or 'cute as a bug'?



Name ______________________

DIRECTIONS: Read the following story. Draw a circle around the correct verbs.

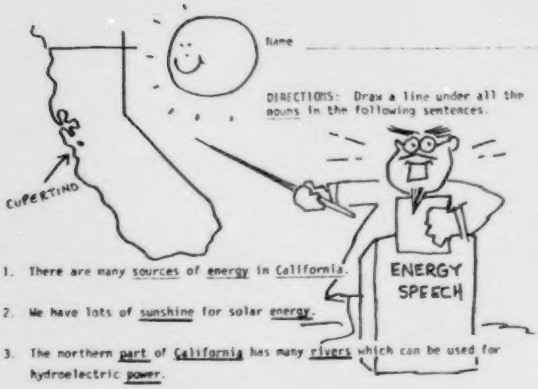
Geothermal Energy

The center of the earth ([✓ is] are) made up of very hot liquid rock. Sometimes some of it (rise [✓ rises]) near the earth's surface. It (made [✓ makes]) the underground water boil. When this hot water or steam (come [✓ comes]) up through a crack in the earth, we ([✓ call] calls) it a "geyser."

Sometimes the steam of the geyser is (carry [✓ carried]) directly by pipes into buildings. In other cases it ([✓ is] are) used to generate electricity. When the steam ([✓ is] are) used to generate electricity, it ([✓ is] are) called geothermal energy.

Many people ([✓ like] likes) geothermal energy because it (don't [✓ doesn't]) pollute the air. At the present time it ([✓ is] are) usually too expensive and hard to use. We still (had [✓ have]) lots to find out about using geothermal energy.

Answers 443, 444, 445, 446



Name ______________________

DIRECTIONS: Draw a line under all the nouns in the following sentences.

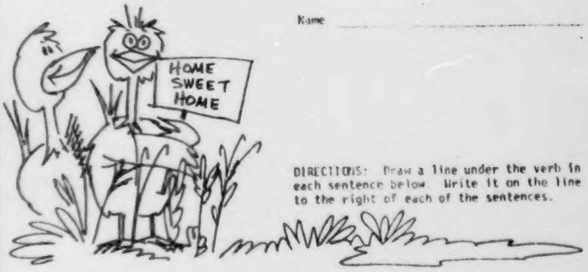
1. There are many sources of energy in California.
2. We have lots of sunshine for solar energy.
3. The northern part of California has many rivers which can be used for hydroelectric power.
4. The southern part of California has many oil fields.
5. The land near Mt. Lassen has many hot springs.
6. This volcanic area produces geothermal power.
7. Even windmills are used for power in California.
8. We have several nuclear power plants in this state, too.
9. California also has more people than any other state.
10. All these people need and use a lot of energy.

Write the two proper nouns that are in sentences on these lines.

California ______ Mt. Lassen ______

447

Name ______________________



DIRECTIONS: Draw a line under the verb in each sentence below. Write it on the line to the right of each of the sentences.

THE MARSHLAND

1. The bay marshes furnish habitats for fish, plants, and other wildlife. furnish
2. The Suisun Marsh is the largest wetland around San Francisco Bay. is
3. It contains 85,000 acres of tidal marshland. contains
4. This totals more than 10% of California's remaining wetland area. totals
5. The marshlands provide an important resting place, feeding area, and wintering ground for migrating birds. provide
6. Hundreds of thousard of birds live in the marshlands around the Bay. live
7. Many rare and endangered species make their hore in the marshlands. make
8. Life in the marshlands depends on clean water. depends

448

Name ______________________

DIRECTIONS:
Sam is planning ways to save energy.
Draw a line through the ideas that are silly or foolish.

Conservation Class

Sam Spade
May 1, 1980

My Ways to Save Energy

1. I will use both sides of my writing paper.
2. ~~I will stop eating spinach.~~
3. I will turn off the TV when I'm not watching it.
4. ~~I will use paper plates and cups instead of ones that need to be washed.~~
5. ~~I will dig an oil well in my back yard.~~
6. I will turn out the lights when I leave the room.
7. ~~I will never wash my face again.~~
8. I will walk or ride my bike instead of asking my Mom to drive me.
9. I won't stand with the refrigerator door open while I decide what I want to take out.
10. I will turn the water off while I'm brushing my teeth.
11. ~~I won't waste my energy to do my homework.~~
12. I will save things that can be recycled.

449

Name ______________________

DIRECTIONS: Arrange each group of numbers in order (smallest to largest) to read the message.

52	87	60	2	16	99	8	37	63	21	11	29	79	46	58	81
E	I	A	T	E	L	R	A	N	S	E	W	D	T	R	O

Write the numbers on the line. Write the letter that goes with it underneath.

2 8 11 16 21. 29 37 46 52 58 60 63 79 81 87 99
T R E E S W A T E R A N D O I L

162	196	170	100	119	193	180	179	182	105	155	112
R	S	S	A	N	E	U	O	C	R	L	E

143	167	126	139	138	150	181
R	E	A	U	T	A	R

100 105 112 119 126 138 139 143 150 155 162 167 170 179 180 181 182 193 196
A R E N A T U R A L R E S O U R C E S

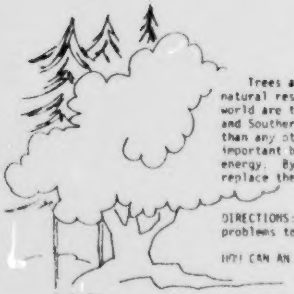
521	413	311	864	973	200	374	287	723	924	226	598
C	N	D	R	A	F	I	N	I	I	O	A

600	899	241	789	790
L	N	U	F	O

200 226 241 287 311 374 413 521 598 600 723 789 790 864 899 924 973.
F O U N D I N C A L I F O R N I A

450

Answers 447, 448, 449, 450



Name ______________________

Trees are one of California's most valuable natural resources. Among the tallest trees in the world are the redwoods growing in Northern California and Southern Oregon. California has more forest area than any other state except Alaska. Trees are important because they provide a renewable source of energy. By planning wisely we can grow new trees to replace the trees we use.

DIRECTIONS: Use the code and your answers to the problems to solve the riddle.

HOW CAN AN ELEPHANT GET TO THE TOP OF A TREE?

Code Box

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

38	45	53	96	73	90	29
- 19	- 36	- 33	- 81	- 59	- 89	- 15
19	9	20	15	14	1	14
S	I	T	O	N	A	N

79	70	42	44	65	60	32	51
78	- 67	- 27	- 26	- 51	59	- 18	- 47
1	3	15	18	14	1	14	4
A	C	O	R	N	A	N	D

82	80	60	72
- 59	- 79	- 51	- 52
23	1	9	20
W	A	I	T

Name ______________________

San Francisco Bay is important because it provides a large amount of our food. Fishermen take hundreds of pounds of fish from the Bay everyday.

DIRECTIONS: DO the problems to answer the riddle. Draw a line under the correct answer.

1. 3 tens and 4 ones is the same as
   - 6 fives and 4 ones = O
   - 2 fives and 6 ones = T
   - 3 tens and 1 five = B
2. 3 fives and 10 ones is the same as
   - 2 tens and 2 fives = I
   - 4 fives and 8 ones = O
   - 5 fives and 0 ones = N
3. 6 fives and 3 ones is the same as
   - 4 fives and 6 ones = P
   - 3 tens and 3 ones = E
   - 2 tens and 1 five = T
4. 1 ten and 4 fives is the same as
   - 2 tens and 5 ones = L
   - 3 tens and 0 ones = B
   - 2 tens and 1 five = A
5. 1 five and 6 ones is the same as
   - 2 fives and 1 one = A
   - 1 ten and 3 ones = O
   - 3 fives and 0 ones = R
6. 3 tens and 10 ones is the same as
   - 2 tens and 4 ones = W
   - 4 tens and 6 ones = E
   - 4 tens and 0 ones = I
7. 1 ten and 1 five is the same as
   - 15 ones = T
   - 2 fives and 4 ones = Y
   - 1 ten and 3 ones = P
8. 2 fives and 6 ones is the same as
   - 2 tens and 1 one = M
   - 3 fives and 1 one = S
   - 1 ten and 1 five = V
9. 7 fives and 0 ones is the same as
   - 3 tens and 1 five = H
   - 1 ten and 4 fives = K
   - 6 fives and 2 ones = T
10. 4 tens and 5 ones is the same as
    - 6 fives and 5 ones = I
    - 2 tens and 10 fives = A
    - 9 fives and 0 ones = K
11. 2 tens and 6 ones is the same as
    - 5 fives and 1 one = R
    - 1 ten and 2 fives = L
    - 3 tens and 2 ones = P

Use the letters next to the correct answers to fill in the blank spaces.

WHAT IS THE DIFFERENCE BETWEEN A FISHERMAN AND A LAZY STUDENT?

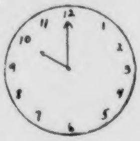
	O	N	E	B	A	I	T	S	H	I	S
Problem number	1	2	3	4	5	6	7	8	9	6	8

H	O	O	K	.....	T	H	E	O	T	H	E	R
9	1	1	10		7	9	3	1	7	9	3	11

H	A	T	E	S	H	I	S	B	O	O	K
9	5	7	3	8	9	6	8	4	1	1	10

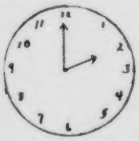
Name ______________________

DIRECTIONS: Use the clocks below to solve the problems

1. 

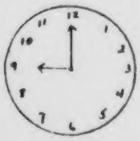
Jackie is going to work at the recycling center today. She said that she would stay for six hours. If she begins at 10:00 A.M., what time will she be through?

4:00 P.M.

2. 

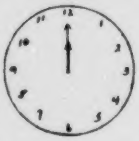
Russ is going to collect newspapers in his neighborhood. It is now 2:00 P.M. It will take him 3½ hours to collect the papers. What time will he be done?

5:30 P.M.

3. 

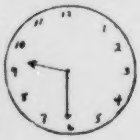
Carolyn and Ed are going to clear the hiking trail of litter. They know the job will take five hours. If they start at 9:00 A.M., what time will they be finished?

2:00 P.M.

4. 

Carlton is spending the day working in his garden. Pulling out the weeds will take him 1½ hours. Planting the new seedlings will take 2½ hours. If he starts at 12:00 P.M., what time will he be done?

4:00 P.M.

5. 

Betty and Rex are going to help the Rangers plant new trees in the park. It will take them one hour to drive there and four hours to plant the trees. If they leave home at 9:30 A.M., what time will they get home? (Don't forget that they have to drive home too.)

3:30 P.M.

Name ______________

What's the big word that means growing plants without soil?

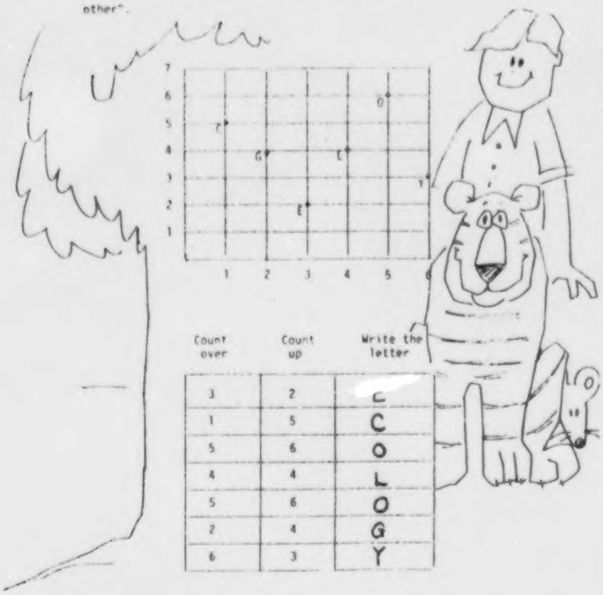
H	Y	D	R	O	P	O	N	I	C
14	8	23	12	19	16	19	15	13	17

D $\begin{array}{r}23\\3\overline{)69}\end{array}$	P $\begin{array}{r}16\\2\overline{)32}\end{array}$	N $\begin{array}{r}15\\5\overline{)75}\end{array}$
I $\begin{array}{r}13\\4\overline{)52}\end{array}$	R $\begin{array}{r}12\\7\overline{)84}\end{array}$	H $\begin{array}{r}14\\6\overline{)84}\end{array}$
Y $\begin{array}{r}8\\9\overline{)72}\end{array}$	O $\begin{array}{r}19\\4\overline{)76}\end{array}$	C $\begin{array}{r}17\\5\overline{)85}\end{array}$

Answers 451, 452, 453, 454

Name ______________________

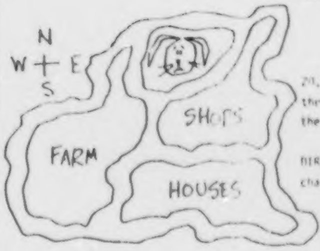
DIRECTIONS: Count over and up to find the word that means "the study of the relationship of living things to their environment and to each other".



Count over	Count up	Write the letter
3	2	E
1	5	C
5	6	O
4	4	L
5	6	O
2	4	G
6	3	Y

Write the word ECOLOGY

Name ______________________



Rabbit Island is home for more than 20,000 rabbits. Changes are being made on the island which are causing problems for the rabbits.

DIRECTIONS: Read the problems to see what changes are being made. Do the work.

1. There are 325 acres on Rabbit Island. A farmer has bought 90 acres to grow corn. How many acres are left for the rabbits to live on?
Color the farm area on the island.

3 2 5 acres on the island
-9 0 acres for the farm
235

2. A builder has bought 143 acres of the land that is left to build houses on. Now how much of the island is left for the rabbits?
Color the housing area on the island.

235
143 (acres for houses)
92

3. A shopping center is being built for the people who will live in the houses. The shopping center needs 48 acres of land for stores and parking. How many acres do the rabbits have now?
Color the shopping center area on the island.

92
48 (acres for shopping centers)
44 acres left for the rabbits

4. Roads were needed by the people. The roads took up 15 more acres. How many of the original 325 acres do the rabbits have now?
Color in the road area.
What do you think will happen to the rabbits?

44
15 (acres for roads)
29 acres left for the rabbits

Name ______________________

The students in Mr. Campbell's class are collecting newspapers and aluminum cans. They are going to sell them to be recycled in order to make money for the class picnic.

Here are some things you need to know to help them find out how much money they will make for the picnic.

The paper company buys old newspapers. They pay $1.00 for each 100 pounds of newspapers.

The aluminum company pays $ .17 for each pound of aluminum cans. It takes 23 twelve ounce cans to make one pound.

Do the problems to find out how much money they made for their picnic.

1. There are 25 students in Mr. Cambell's class. Each student collected 60 pounds of newspapers. How many pounds did they have all together? How much did they get for the newspapers?

25
60
1500 pounds

100 ⟌1500 = 15

15
1.00
$15.00

2. Each of the students were able to collect 207 cans. How many aluminum cans was this all together? How many pounds did they have to sell? How much money did they get for the aluminum cans?

207
25
1035
414
5175 cans

23 ⟌5175 = 225 pounds
46
57
46
115
115

225
.17
1575
225
$38.25

3. How much money did the students receive for their class picnic?

$ 15.00
38.25
$53.25

Name ______________________

DIRECTIONS: Read about some of the problems facing San Francisco Bay. Subtract to find the answers to the questions.

1. San Francisco Bay is getting smaller. Much of the marshlands around the Bay has been filled in with dirt to provide land for housing, industry and farming. The original size of the Bay was 680 square miles. Today it is about 400 square miles. How many square miles have been lost due to filling in the marshlands?

280 square miles have been lost due to filling in the Bay.

2. There are 276 miles of shoreline around San Francisco Bay. Almost 266 miles of the shoreline is privately owned. How many miles of the shoreline are left for the use of everyone?

10 miles are available for public use.

3. At one time there were more than 300 square miles of natural marshlands surrounding the Bay. These marshlands provided homes and food for thousands of birds and other animals. Now only about 75 square miles of marshlands are left. How many square miles have been lost?

225 square miles of marshlands are gone.

4. Everyday almost 400 million gallons of treated sewage and waste are poured into the Bay. Industries are responsible for 269 million gallons of this waste and sewage. The rest comes from private homes. How many gallons of waste and sewage from private homes is poured into the Bay everyday?

131 million gallons of waste and sewage poured into the Bay comes from private homes.

505

Name ______________________

Alice is going to start a hydroponic garden. This means that she is going to grow her plants in water without soil.

DIRECTIONS: Help Alice add up the cost of the things she needs to buy.

1. Alice needs one box of charcoal to help keep the water clean. The charcoal will cost $ .79. She also needs one pound of smooth pebbles to help hold the roots. The pebbles cost $ .59. How much will the pebbles and charcoal cost together?

$ .79
.59
$ 1.38

2. She is going to buy two plants that can be divided to make more plants. One plant is the "Spider" plant. It costs $1.98. The other plant is a "Creeping Charlie" which costs $1.79. How much will the two plants cost together?

$ 1.98
1.79
$ 3.77

3. Alice will also need root starter, fertilizer and jars. The root starter costs $1.69. The fertilizer costs $1.39. The jars will not cost her anything because she is going to use old ones from home. How much does she need for the starter and the fertilizer?

$ 1.69
1.39
$ 3.08

4. How much will Alice have to spend for all the things she needs for her hydroponic garden?

$ 1.38
3.77
3.08
$ 8.23

HER
AEE
TICKLE
TICKLE

Name ______________________

Recycling is one way people are helping the "balance of nature." By recycling materials, we save many of the natural resources needed to make the things we use and can make money too.

DIRECTIONS: Read how much money each person made. Write the amounts in standard notation.

1. Joan collected newspapers for recycling. She sold them to a paper pulp company for two dollars, one quarter, and four pennies. $2.29
2. Jack and Bob cashed in their aluminum cans. They made three dollars, four dimes, and one nickel. $3.45
3. Sally returned her deposit bottles to the store. She got one dollar, two quarters, one dime and one nickel. $1.65
4. Rex saved cardboard which he sold to a scrap dealer. He made three dollars, two dimes, and four pennies. $3.24
5. The Boy Scout troop saved newspapers for a whole year. When they sold them, they made thirty two dollars, one quarter, one dime, and two pennies. $32.37
6. Jennifer saved magazines. The scrap dealers do not want them because much of the paper is coated with plastics and cannot be easily recycled. Jennifer gave them to the hospital instead. She didn't make any money, but she made lots of friends.

Name ______________________

Forest Rangers do many things to help the 'balance of nature'.

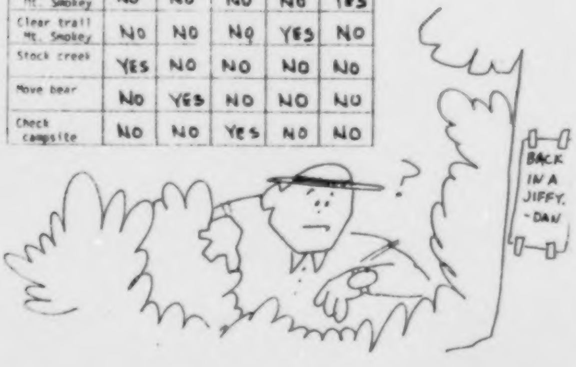
Ranger Dan has five things planned to do today. He is going to stock the creek with baby trout, move a troublesome bear to a new place, and check the campsite for litter that could be harmful to animals. He is also going to clear the hikers' trail on Mt. Smokey and plant some new pine tree seedlings there.

His partner, Ranger Rick, wants to find him but doesn't know at what time he will be where. Help Rick figure out when Ranger Dan will be at each place. Rick has the following information:

1. Ranger Dan will not go to Smokey Mountain before 3:00 P.M.
2. Ranger Dan won't stock the creek or move the bear after 1:00 P.M.
3. Ranger Dan will only clear the trail or stock the creek on the hour.

DIRECTIONS: Write 'no' or 'yes' in every box where you know the answer. Once you have a 'yes', all the other boxes in that row or column must be a 'no'. Remember that Ranger Dan will only be at each place once.

	10:00 A.M.	11:30 A.M.	1:30 P.M.	5:00 P.M.	9:30 P.M.
Plant trees Mt. Smokey	NO	NO	NO	NO	YES
Clear trail Mt. Smokey	NO	NO	NO	YES	NO
Stock creek	YES	NO	NO	NO	NO
Move bear	NO	YES	NO	NO	NO
Check campsite	NO	NO	YES	NO	NO


?
BACK IN A JIFFY. -DAN

Name ______________________

Mrs. Black's class has just read a booklet called "Deadly Throwaways". It told them some reasons why litter is harmful to animals. Here are some things they learned.

Birds can get hung up in [illegible]. Animals can choke on pop tops or plastic wraps. Small animals can fall into bottles or cans. If they can't get out, they are either fried, frozen, or starved to death. Garbage that is thrown out of cars attracts animals to the highways where they can get hit by passing cars. Litter can really be dangerous for animals.

Awk!
EEK
BEANS

DIRECTIONS: The students decided to have a clean-up day. They formed groups to pick up litter in the neighborhood. Read the problems. Add and divide to find the answers to the two step problems.

1. Bob and Carol and Ted and Alice were in the first group. They went to the park. Ted and Alice picked up 33 pop tops. Bob and Carol picked up 51 pop tops. How many did the first group pick up all together? How many was this for each person?

33
51
84 tops

$4\overline{)84}$ 21 each person

2. The students in group two picked up empty pop bottles. Marcia found 14 bottles. Betty and Sue found 19 bottles. How many bottles did the three girls find all together? How many was this for each girl?

14
19
33 bottles

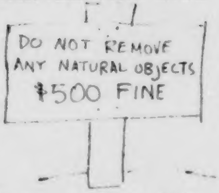
$3\overline{)33}$ 11 each girl

3. The third group filled bags with papers and other litter. Sam filled 7 bags with litter. Sandy and Mark each filled 4 bags. How many bags did group three fill all together? How many bags would this be for each person?

7
4
4
15 bags

$3\overline{)15}$ 5 each person

Name ______________________



Many parks and natural areas have signs telling people that it is against the law to take rocks, plants, or animals away with them.

Some people think that one little rock, flower or starfish isn't going to be a big deal. Is it?

DIRECTIONS: Do the word problems to see what could happen if everyone thought that way.

1. Three classes of students visit Natural Bridges nature area every day. Each class has 30 students. If each student takes home just one little rock, how many little rocks will be gone in one day?

30
3
90

2. How many little rocks will be gone in one week (7 days)?

90
7
630

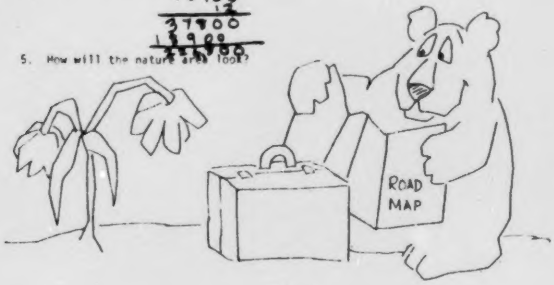
3. How many little rocks will be gone in one month (30 days)?

630
30
18,900

4. How many little rocks will be gone in one year (12 months)?

18900
12
37800
18900
226800

5. How will the nature area look?



Name ______________________

Are your classmates energy savers?

12				
11				
10				
9				
8				
7				
6				
5				
4				
3				
2				
1				
	car	bus	bike	walking

Ask 12 of your classmates how they got to school - by bike, car, walking, or the bus? Write their answers on the lines below. Use this information to make a bar graph.

1. ______________________
2. ______________________
3. ______________________
4. ______________________
5. ______________________
6. ______________________
7. ______________________
8. ______________________
9. ______________________
10. ______________________
11. ______________________
12. ______________________

Name ______________________

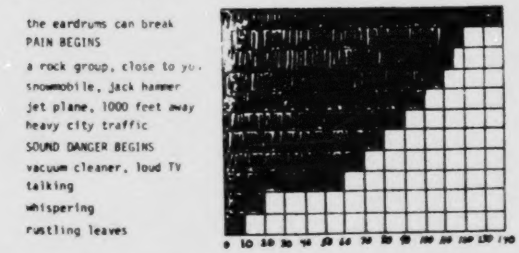
NOISE

Noise is another type of pollution. The sounds of people and machines fill the air of busy cities, and even the country sometimes. We hear the sounds of jet planes, automobiles, TV, and hundreds of other things every day.

People get used to noise pollution and learn to shut sound out of their minds. But steady noise can make people lose sleep, have accidents, get tired, behave angrily, and even become deaf.

Noise pollution is measured in decibels. At zero decibels, a sound is so soft you can hardly hear it. At 180 decibels, noise can kill you.

Common Sounds in Decibels



Use the decibel graph to answer the following questions.

1. How many decibels is a loud TV? 70
2. How many decibels is heavy city traffic? 90
3. Which is louder, a snowmobile or a vacuum cleaner? snowmobile
4. At what decibel level does sound actually hurt your ears? 120
5. At what decibel level does noise become dangerous? 80
6. What decibel level can break your eardrums? 140

Name ______________________

DIRECTIONS: Read the story. Draw a line under all the number words. Answer the questions at the bottom of the page.

The Giant Panda

The giant panda is probably the rarest of all animals. Although the panda looks like a bear, it is actually related to the raccoon. It can only be found one place in all the world - the bamboo forests between China and Tibet. Perhaps it is called "giant" because it grows to a weight of three hundred pounds and a length of five feet. It is an endangered animal mostly because of over-hunting and the many numbers who have been caught for zoos. In 1936, the first live giant panda brought to the United States weighed only five pounds. It cost nearly nine thousand dollars. Fifteen months later, the giant panda, "SU-Lin" died at the Brookfield Zoo in Chicago.

Use the story to answer the questions. Write your answers as standard numerals.

1. How much can a grown giant panda weigh? 300 pounds
2. How tall does a giant panda get to be? 5 feet
3. How much did the first giant panda cost the zoo? $9,000.00
4. How long did the giant panda live at the zoo? 15 months

507

Answers 463, 464, 465, 466

Name

DIRECTIONS: Read the story. Use the information to answer the questions.
Be sure to write your answers as standard numerals.

ENDANGERED ANIMALS

The United States government began keeping lists of endangered and threatened wildlife in 1967. They now list one hundred seventy-four kinds of endangered animals and eleven more that are threatened.

Many of these animals are found in California. It is believed that there are now less than twenty-nine California Condors still alive. The Salt Marsh Harvest Mouse population is said to be below one thousand due to the changing conditions of San Francisco Bay.

Laws and wildlife management have helped some animals. For example, in 1935 there were less than ninety-five Trumpeter Swans alive. A national refuge was built to protect their habitat and, at last count in 1970, there were more than one thousand forty birds alive.

We can protect our wildlife.

EXTINCT
COO COO
BIRD

Complete the sentences by writing the correct numerals in the spaces.

1. The United States government lists 174 kinds of endangered animals.
2. There are 11 more animals that are threatened.
3. There are less than 29 California Condors still alive.
4. The Salt Marsh Harvest Mouse population is said to be below 1000.
5. The Trumpeter Swan population has grown from 95 in 1935 to 1040 in 1970.

Name

DIRECTIONS. Follow the instructions in each sentence to answer the question.

What do we call energy that is produced from underground steam and heat?

G E O T H E R M A L
1 2 3 4 5 6 7 8 9 10

Space Number	Instructions
1.	If 4 X 4 = 16, write G. If not, write P.
2.	If 7 ÷ 3 = 21, write O. If not, write E.
3.	If 38 + 14 = 52, write O. If not, write C.
4.	If 99 ÷ 9 = 11, write T. If not, write A.
5.	If 64 X 8 = 8, write D. If not, write H.
6.	If 8 - 4 = 12, write O. If not, write E.
7.	If 9 X 5 = 45, write R. If not, write P.
8.	If 100 ÷ 20 = 5, write M. If not, write I.
9.	If 25 + 25 = 0, write M. If not, write A.
10.	If 42 - 7 = 35, write L. If not, write T.

Name

Water is one of our most important natural resources. We could not live without it. We borrow it from the natural water cycle, use it, and then return it to the cycle. Water is not used up, but recycled. We must clean the used water before returning it to the water cycle. If it is not cleaned, then we have polluted water. The more we use, the more we have to clean.

It takes a lot of water to make the things we use.

DIRECTIONS: In the problems below, change the quart measurements to gallons by dividing. Remember that it takes 4 quarts to make 1 gallon.

1. It takes 600 quarts of water to make the paper for one Sunday newspaper. How many gallons is that?

$\begin{array}{r}150\\ 4\overline{)600}\end{array}$ gallons

2. It takes 2600 quarts of water to make the steel for one bicycle. How many gallons is that?

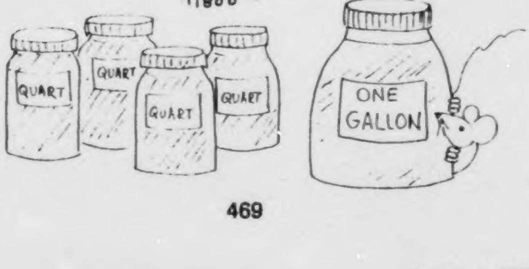
$\begin{array}{r}650\\ 4\overline{)2600}\end{array}$ gallons

3. It takes 300 quarts of water to grow just one ear of corn. How many gallons are needed?

$\begin{array}{r}75\\ 4\overline{)300}\end{array}$ gallons

4. It takes 800 quarts of water to make the rubber for one car tire. How many gallons is that?

$\begin{array}{r}200\\ 4\overline{)800}\end{array}$ gallons



Name

GOLD MINING

The discovery of gold in 1848 brought thousands of people to California. They came to make their fortunes by mining for gold.

The first miners used only a pick, shovel and wash pan. They scooped up sand and gravel from the river and then swirled it around so that the sand washed over the rim and the heavier gold stayed in the bottom of the pan. This method of panning for gold was very slow so some miners invented a faster way.

They made a 'rocker' or 'cradle'. This was a wooden box with a wire bottom that was mounted on curved runners. Dirt was shoveled into the box and then water was poured through the cradle as it was rocked. The sand and dirt washed through the screen but the larger gold nuggets remained. This way was faster than gold panning but some people felt they could do it still faster.

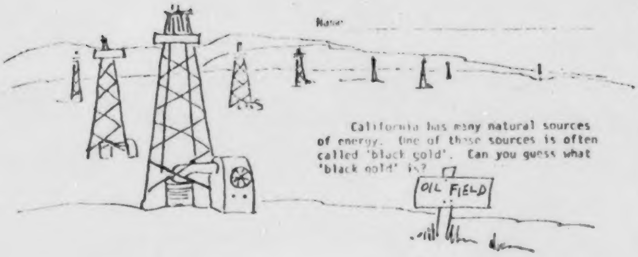
These miners used 'sluice boxes.' These were large, long boxes with screen bottoms that were placed in or next to the river. Water and gravel ran through the boxes and the screen again trapped the gold. Sluice boxes were faster than panning or rockers but still miners looked for a faster way.

Next came 'hydraulic' mining and dredging. These were far faster than all the other ways. Hydraulic mining uses water from a large hose to wash away soil and rocks. Sometimes the force of the water was so great that it also washed away trees and boulders as well as the dirt. Whole mountains could be washed away by hydraulic mining. Gold dredgers were large machines that floated on the river waters. A large scoop on the dredger dug out a channel ahead of the dredger and then dumped the waste behind it in the river. These two methods of mining produced more gold faster than all the other ways but left piles of rocks and waste and destroyed rivers and lands along the shores. The results of these methods can still be seen today even though the miners have been gone for over a hundred years.

Answer the following questions. Write your answers on the back of this paper.

1. Which type of mining did the least damage to the environment?
   Panning
2. Which types of mining produced the most gold?
   Hydraulic mining and dredging
3. What did hydraulic mining do to our environment?
   Left piles of rocks and waste and destroyed rivers and lands along the shores
4. What did gold dredgers do to the rivers?
   Destroyed them
5. If dredgers and hydraulic mining were so destructive to the environment, why did the miners still use these methods?
   Because they produced more gold faster than all the other methods

Name ______________________



California has many natural sources of energy. One of these sources is often called 'black gold'. Can you guess what 'black gold' is?

In the early 1900's a second Gold Rush began in California. This gold was black. Oil had been discovered.

Hundreds of new pioneers came to California to make their fortunes in the oil fields. Many of the oilmen, like the gold miners, were rough and rugged in their search for oil. Claims for rights to oil fields near the towns of Taft and Coalinga were staked and protected as they had been during the gold rush, with fists and guns.

The demand for oil grew. Oil was needed as a fuel to produce electricity. Refined oil, which is gasoline, was needed as a fuel for the new 'horseless carriages'. New oil wells were started almost everyday. Hundreds of wells were dug in the San Joaquin Valley and Kern River Oil Fields. Land, which ten years before had been traded for a few cows, now sold for a thousand dollars an acre and more. Oil wells were drilled everywhere. Some oil derricks were even built in the backyards of many Southern California homes.

Today, California ranks second only to Texas as the greatest oil production state. However, Alaska may soon challenge both Texas and California as oil flows from the new Alaskan pipeline.

Write the answers to these questions on the back of this paper.

1. What is black gold? Oil
2. How did the discovery of oil change the population of California? More people came out to California
3. What happened to the cost of land in California? Became more expensive
4. How important is California in the production of oil? Second ranked to Texas

Name ______________________

Natural Sources of Energy in California

Key

O = oil sources

⁘ = forest areas

ᚼ = rivers

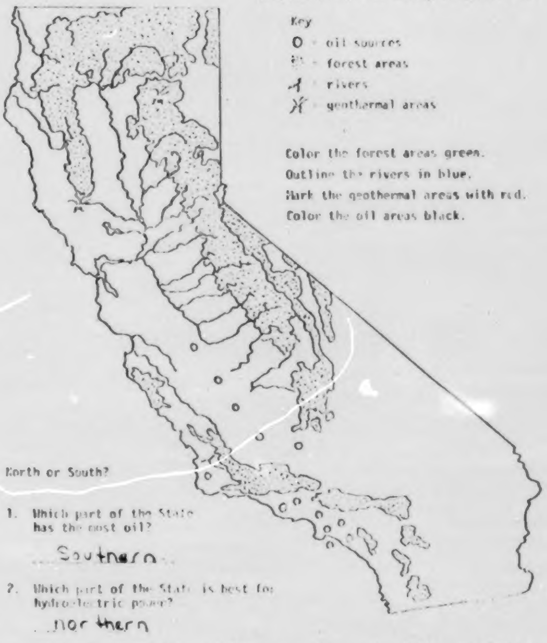
Ӿ = geothermal areas

Color the forest areas green.

Outline the rivers in blue.

Mark the geothermal areas with red.

Color the oil areas black.



North or South?

1. Which part of the State has the most oil?

Southern

2. Which part of the State is best for hydroelectric power?

northern

3. Which part of the State are the geothermal areas located? northern

Name ______________________

CALIFORNIA REPUBLIC

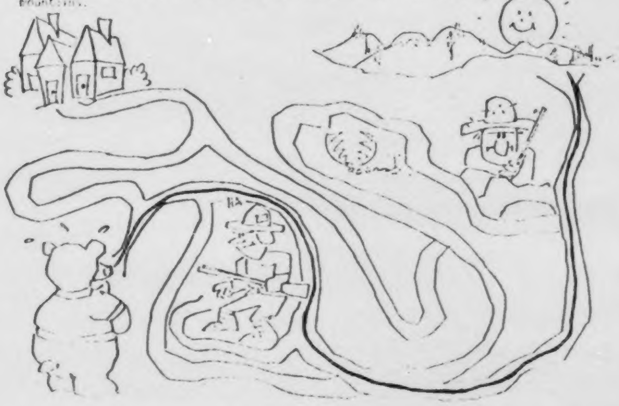
The Grizzly Bear

The grizzly bear is the state animal of California. His picture is on our state flag and on the state seal. This is sort of strange because there are no grizzly bear in California now.

At one time, there were hundreds of thousands of grizzly bears living in the western parts of North America, from Mexico to Alaska. Today, there are only about 600 grizzlies left in the whole United State Most of these bears live in and around Yellowstone National Park and the Rocky Mountains.

Most of the grizzly bears left California because of people. Grizzlies need large areas of wilderness. They do not get along well with people. Many were killed because people felt they were dangerous and a threat to livestock. Many others were killed for sport or for their fur pelts.

Help the grizzly bear find his way through the maze to the safety of the mountains.



Name ______________________

The Marshlands

The marshlands around the San Francisco Bay provide a home for many different kinds of wildlife. It is a special environment because of the mixture of salt water and fresh water. The salt water comes into the Bay from the Pacific Ocean. The fresh water comes from the many rivers that end in the Bay.

The marshlands are a habitat for many plants and animals that could not live anywhere else.

Use the code to find the names of four plants and animals that live in the marshlands.

A	B	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	10	11	12	13
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
14	15	16	17	18	19	20	21	22	23	24	25	26

1. M U D H E N
13 21 4 8 5 14

2. C L A M S
3 12 1 13 19

3. G O P H E R S N A K E
7 15 16 8 5 18 19 14 1 11 5

4. P I C K L E W E E D
16 9 3 11 12 5 23 5 5 4

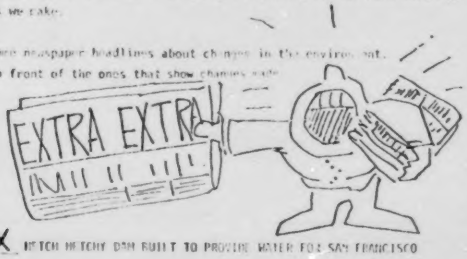
Answers 472, 473, 475, 476

Name ______________________

Our Changing Environment

Man is the only living thing that can change his environment to meet his needs. Some of these changes have not hurt the environment. But, some of the changes have damaged the earth, air and water. We are now beginning to look more carefully at the changes we make.

Here are some newspaper headlines about changes in the environment. Put an X in front of the ones that show changes made by man.



X HETCH HETCHY DAM BUILT TO PROVIDE WATER FOR SAN FRANCISCO

___ LIGHTNING CAUSES 600 ACRE FOREST FIRE

X TWO HUNDRED HOMES TO BE BUILT ON OLD MACDONALD'S FARM

X SMOG ALERT TODAY

___ EARTHQUAKE DAMAGES SAN FRANCISCO

X MORE FILL DUMPED IN SAN FRANCISCO BAY TO PROVIDE LAND FOR HOMES

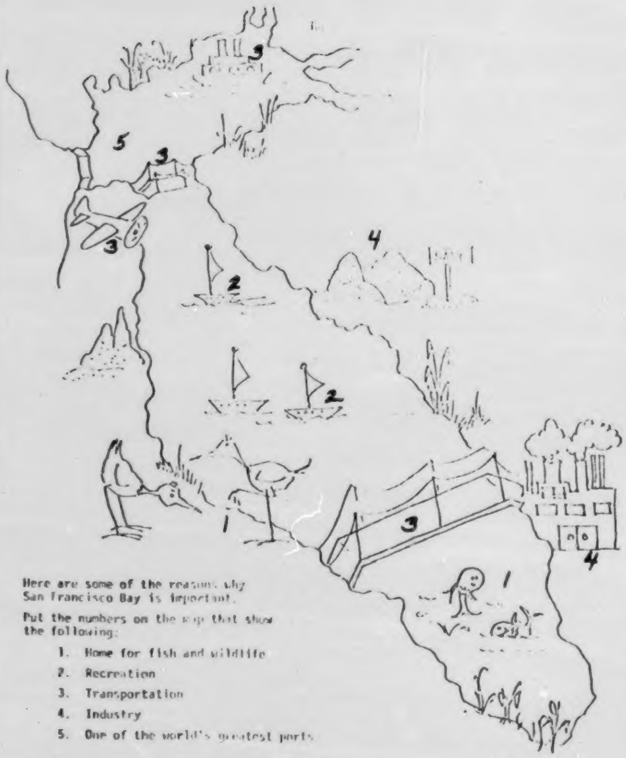
___ FLOODING CAUSED BY HEAVY RAINS

X BROWN PELICAN DEATHS LINKED TO PESTICIDE USE

X THIRTY ACRES OF TIMBER CUT TO PROVIDE [illegible] CAMPING GROUND

X SIX LANE HIGHWAY COMPLETED THROUGH SIERRA NEVADA MOUNTAINS

477

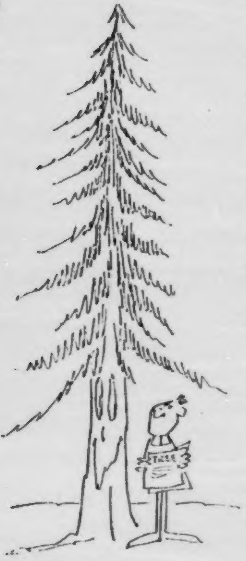


Here are some of the reasons why San Francisco Bay is important.

Put the numbers on the map that show the following:

1. Home for fish and wildlife
2. Recreation
3. Transportation
4. Industry
5. One of the world's greatest ports

478



Name ______________________

Redwood Trees

The redwood tree is the state tree of California. Thousands of years ago, redwood trees grew along the Pacific coast from California to Alaska. The ice age covered and killed most of these redwood trees. Now two kinds, the Coast and Sierra Redwoods, grow only in California.

Both kinds of redwood trees are called Sequoias in honor of a Cherokee Indian chief. Chief Sequoyah invented an alphabet which taught the entire Cherokee nation to read and write in six months.

A coast redwood tree is the tallest tree in the world. It is 328 feet tall. Some sierra redwoods have been living for more than three thousand years.

The redwood trees are an important natural resource in California. People have used redwood lumber for many things. The wood lasts much longer than other kinds of wood. Redwood is not good for fires because it does not burn easily. This is because there is no pitch in the wood.

Not much sierra redwood lumber is cut today because most of the trees are in National and State Parks. They are protected by law.

Write the underlined letters on the blank spaces. If you copy them in order, you will learn something else about redwood trees.

THE CALIFORNIA REDWOODS ARE THE LARGEST LIVING THINGS ON THE EARTH!

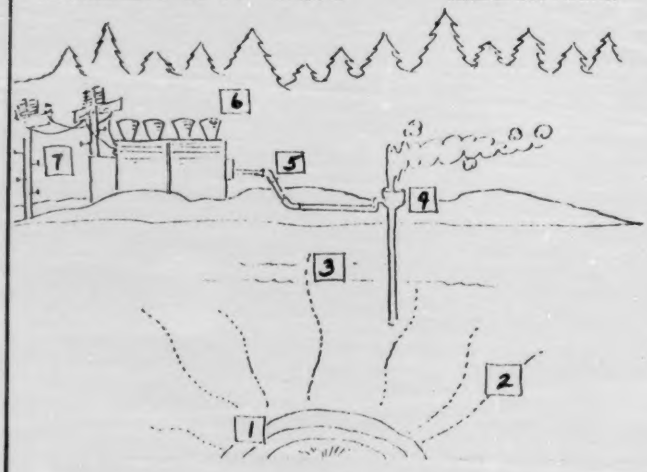
479

Name ______________________

How Geothermal Energy Works

1. Magma, the molten rock found deep in the earth, is the source of the heat.
2. The heat energy warms the soil and rocks above the magma.
3. Underground water is heated by the soil and rocks.
4. A well is dug to reach the hot water and steam.
5. A pipe in the well carries the hot water and steam to a generating plant.
6. The steam turns turbines in the plant to generate electricity.
7. Electricity is sent to cities through transmission lines.

DIRECTIONS: Put the numbers in the boxes to show where each thing happens.



480

Answers 477, 478, 479, 480

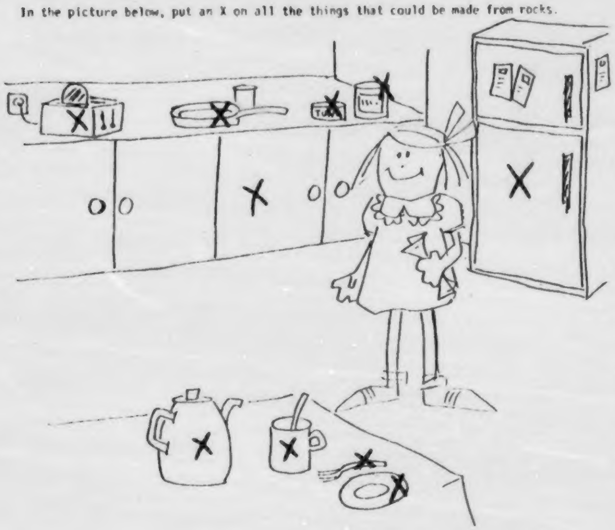
Name ______________________

Rocks and minerals are necessary to our everyday life. Plain old rocks, that may be sliced or broken up, are often used as building materials, in gardens, and in making roadways.

Refined rocks, that is rocks in which some of the minerals have been removed, are used to make concrete and cement, dishes and glass. Dentists even use crushed up rock, which is called pumice, to clean your teeth.

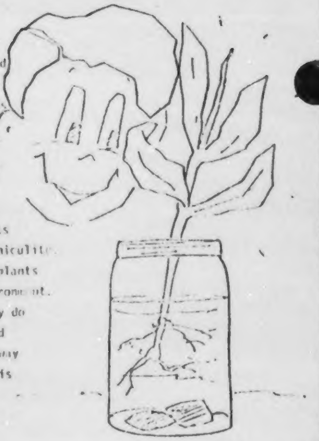
Metals are made from rocks that have been "cooked" to remove different metal ores such as iron, copper, silver, gold, and aluminum.

In the picture below, put an X on all the things that could be made from rocks.



Name

WHAT IS HYDROPONIC GARDENING?



Hydroponics comes from the Greek word that means 'water'. At first, hydroponic gardening was the method of growing plants in water without soil. But, scientists found that growing plants in just water caused some problems. The plants did not get enough air and the plant roots had nothing to hold on to.

Now, hydroponic gardeners grow plants in materials such as sand, gravel or vermiculite.

Gardeners like this way of growing plants because they can control the plants environment. Plants can be grown anywhere because they do not use soil. The plants grow faster and produce more food. Growing plants this way also saves water because the same water is used over and over again.

Draw a circle around the right words.

1. Hydroponic gardening is growing plants without ________. water [✓ soil] sun
2. This method of gardening saves ________. [✓ water] sunlight paper
3. Hydroponic gardening makes plants grow ________. slower greener [✓ faster]
4. Plants grown this way can produce more ________. bugs [✓ food] pollution

Try this.

Be a hydroponic gardener. You will need a jar, water, a few bits of charcoal (the kind you put in fish tanks), and a small cutting from a plant.

Fill the jar half full with water. Put a few pieces of charcoal in the jar to keep the water clean. Remove any leaves from your plant cutting that would be under the water. Put the cutting in the jar. Place the jar in a spot where the plant will get light but not bright sunlight. Watch for roots to grow.

Try different kinds of plants to see which ones grow best.

Name ______________________

Early Uses of Natural Resources

Before the discovery of oil and natural gas, the early Californians used many of their natural resources for cooking, to provide light, and to keep warm.

Use the list below to write the names of natural resources you think might have been used for each purpose. Add other things you can think of. Remember, there is no electricity yet.

wood whale oil bees wax buffalo chips
dried sod rocks tree pitch tallow from cattle

Purpose	Fuels
Keeping warm	wood dried sod rocks buffalo chips
For cooking	wood buffalo chips rocks
For lighting	whale oil tallow bees wax tree pitch

Name ______________________

San Francisco Bay

One reason the San Francisco Bay is an important natural resource is that it helps to control the climate. The large body of water keeps the temperature of the surrounding areas from getting too hot or too cold.

Much of the sun's heat energy is absorbed by the bay water. As the water evaporates, it draws heat from the surrounding land. When the land gets cooler than the water, the air absorbs the heat back from the water.

Also, warm air causes winds. The temperature differences of the land and the water keep it nice and breezy.

Complete the following sentences.

1. San Francisco Bay is an important natural resource.
2. The Bay helps to control the climate.
3. Warm air causes winds.

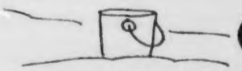
This answer is not in the story, but see if you can write the answer.

4. An even bigger body of water that keeps the San Francisco area cool is the Pacific Ocean.

Try this.

You'll need 2 small jars, 2 thermometer some sand and some water.

Fill one jar with sand and the other w water. Put a thermometer in each jar. Place the jars on a sunny window sill or outside in the sunshine.
Watch the thermometers.
Which one gets hotter?



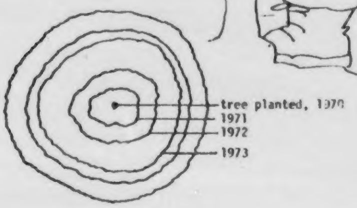
Answers 481, 482, 483, 484

Name ______________________

Tree Rings

Tree rings can tell us many things. You probably already know that you can tell how old a tree was by counting the rings in a cross section of the tree. This is because the tree grows new wood and makes a new ring each year. A tree with nine circles of sapwood (rings) is nine years old.

You can also tell something about what the weather was like when the tree was alive. In a year when there is a lot of rain, the tree grows more. The tree rings are wider. When there is only a little rain, the tree does not grow as much and the tree rings are closer together.



DIRECTIONS: Use the cross section above to answer the questions.

1. During what year was this tree cut down? 1975
2. How old was the tree when it was cut? 5 years
3. Between what years was there a lot of rain? 1972 and 1973
4. Between what years was there just a little rain? 1970 and 1974

- Some gaint sequoias have more than 3,500 rings. Were these trees living before America was discovered? Yes

---

Name ______________________

DIRECTIONS: Read the story. Answer the questions.

WHAT IS SMOG?

The word 'smog' comes from two other words - smoke and fog. Air that is filled with smoke and fog is called smog.

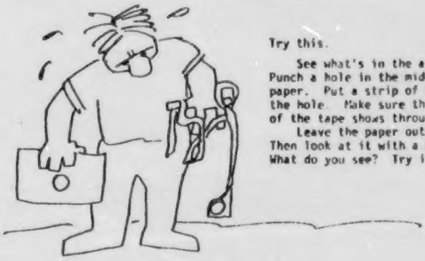
Our air always has some dust, dirt, and other things floating around in it. In cities, there is more dirt and dust in the air. Soot and smoke from factories and gases from cars and trucks make the air dirty. When the air gets dirty, we say it is polluted.

On a windy day, the moving air can blow the polluted air away. When there is no wind, the polluted air hangs like a blanket over the cities. Water drops form around the dust and dirt in the air. This makes the air look brown and dark. This is the smog you can see.

If you breathe this polluted air for a long time, it can hurt your lungs and make you sick. Smog is the worst kind of air pollution.

Complete the sentences.

1. Air that is filled with smoke and fog is called smog.
2. Smog is air that has dust and dirt in it.
3. When the air gets dirty, we say it is polluted.
4. Polluted air can make you sick.



Try this.

See what's in the air around you. Punch a hole in the middle of a piece of paper. Put a strip of clear tape under the hole. Make sure that the sticky side of the tape shows through the hole.

Leave the paper outside for two days. Then look at it with a magnifying glass. What do you see? Try it in different places.

Name ______________________

Renewable Resources

Years ago there were not as many people as there are today. People did not worry about running out of things. If some trees were cut down for wood or fuel, others began to grow. If some animals were killed for food, others were born. Things that were used were replaced by new living things. For this reason, plants and animals are called 'renewable resources'.

Air is also a renewable resource. Plants and animals recycle the air. The plants give off oxygen which is the part of the air that animals need to breathe. Animals, in turn, give off carbon dioxide that plants need.

The other renewable resource is soil. But it takes a long, long time for decaying plants and animals to become soil. We need to take care of the soil.

Nonrenewable resources are things which cannot be replaced. Once they are used they are gone forever. There is a limited amount of these materials on the earth.

Ores, from which metals are made, and minerals that come from the rocks and earth, are nonrenewable resources. Fossil fuels, coal, oil, and natural gas, are also nonrenewable resources. When we use up what there is, there will be no more.

DIRECTIONS: On the space in front of each item below, put a '1' if it is made from a renewable resource. If the item is made from a nonrenewable resource put a '2'.

2 rollerskates
1 lumber
2 knives, forks and spoons
2 cars
2 movie film
1 breakfast cereals

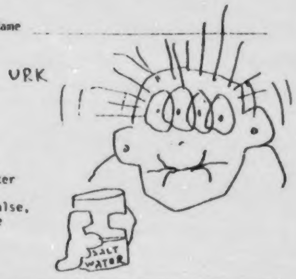
1 paper
2 tv sets
1 wool shirts
2 plastic pots
2 alarm clocks
2 frisbees

2 zippers
2 fishing reels
1 cardboard
2 stoves
2 glasses
2 bicycles

Name ______________________

Follow the directions.

The right answers will tell you where much of our salt comes from.



DIRECTIONS: Read the statement. If you think the statement is true, put the letter in the true column on the space in the answer. If you think the statement is false, put the letter in the false column on the answer space.

For space number:	Statement	True	False
4	People cannot live without salt.	F	P
12	Salt is good for plants.	E	O
3 and 7	Salt is a natural mineral.	N	T
15	Rain and snow dissolve the salt in rocks and carry it to the ocean.	Y	A
9	When water evaporates, it leaves the salt behind.	I	N
8 and 11	Drinking salt water is good for you.	H	C
5	Salt will not dissolve in water.	O	R
13	The oceans are getting saltier.	B	E
2, 6 and 14	Too much salt can kill you.	A	W
1 and 10	No fish can live in salt water.	F	S

AN IMPORTANT SOURCE OF SALT IS . . .

S a n   F r a n c i s c o   B a y
1 2 3   4 5 6 7 8 9 10 11 12   13 14 15

Name ______________________

Metals

Metal comes from ores which are mined from the ground. The ore is crushed and refined to produce pure metal. Gold and silver are two important metals found in California. Other important metals found in the United States are copper, aluminum, uranium, nickel, tin, lead, and especially iron. Iron and steel, which is made from iron, are very useful to us.

DIRECTIONS: Here are the names of some things we use. Many are made totally or partly from metal. Some have no metal at all. Put each word in the list under the correct heading to show how much metal is in each item.

car paper faucet scissors binder clock
book pencil needle TV antenna stockings rug
keys light bulbs applesauce

All Metal	Partly Metal	No Metal
faucet	Light bulbs	applesauce
needle	binder	rug
TV antenna	clock	stockings
scissors	pencil	book
keys	car	paper

Try this.

Find a magnet. Iron is the only metal that a magnet will stick to. Check the things in your house. Make a list of all the things that have iron in them. How will you know?

CONSERVATION FOR CHILDREN
Criterion Referenced Test (Level 4)

Name ______________________________

Date ______________________________

DIRECTIONS: Read the questions. Write your answers on the blank spaces.

1. List four natural sources of energy found in California.

   (wood, trees, oil, wind, water, hydroelectric, geothermal, solar, etc.)

   ____________________ ____________________

2. Write three reasons why some animals are 'endangered'.

   1. *(loss of habitat)*
   2. *(pollution)*
   3. *(pesticide overuse, killed for skins, furs, or sport)*

3. What is 'hydroponic' gardening?

   (growing plants without soil - in water and nutrients)

4. Write the word that means "the study of the relationship of living things to their environment and to each other'.

   (ecology)

5. List three reasons San Francisco Bay is important.

   1. *(Wildlife habitat, marshlands, recreation, fish, climate control,*
   2. *shipping port)*
   3. ______________________________

6. Write three environmental problems of the San Francisco Bay.

   1. (pollution, silt build-up, garbage and sewage, oil spills, land filled
   2. areas, shrinking shoreline)
   3. __________

7. List three ways pollution can hurt plants or animals.

   1. (eating it can make them ill, pesticides poisonous directly or through
   2. food chain, smog impairs breathing, acid rains from burning coal can
   3. destroy plantlife, etc.)

8. List three ways people have hurt the environment.

   1. (Polluted -litter, smog, noise)
   2. (Over use of pesticides; forest fires)
   3. (Waste build-up, dumps, careless mining techniques)

9. Write three ways people can help the environment.

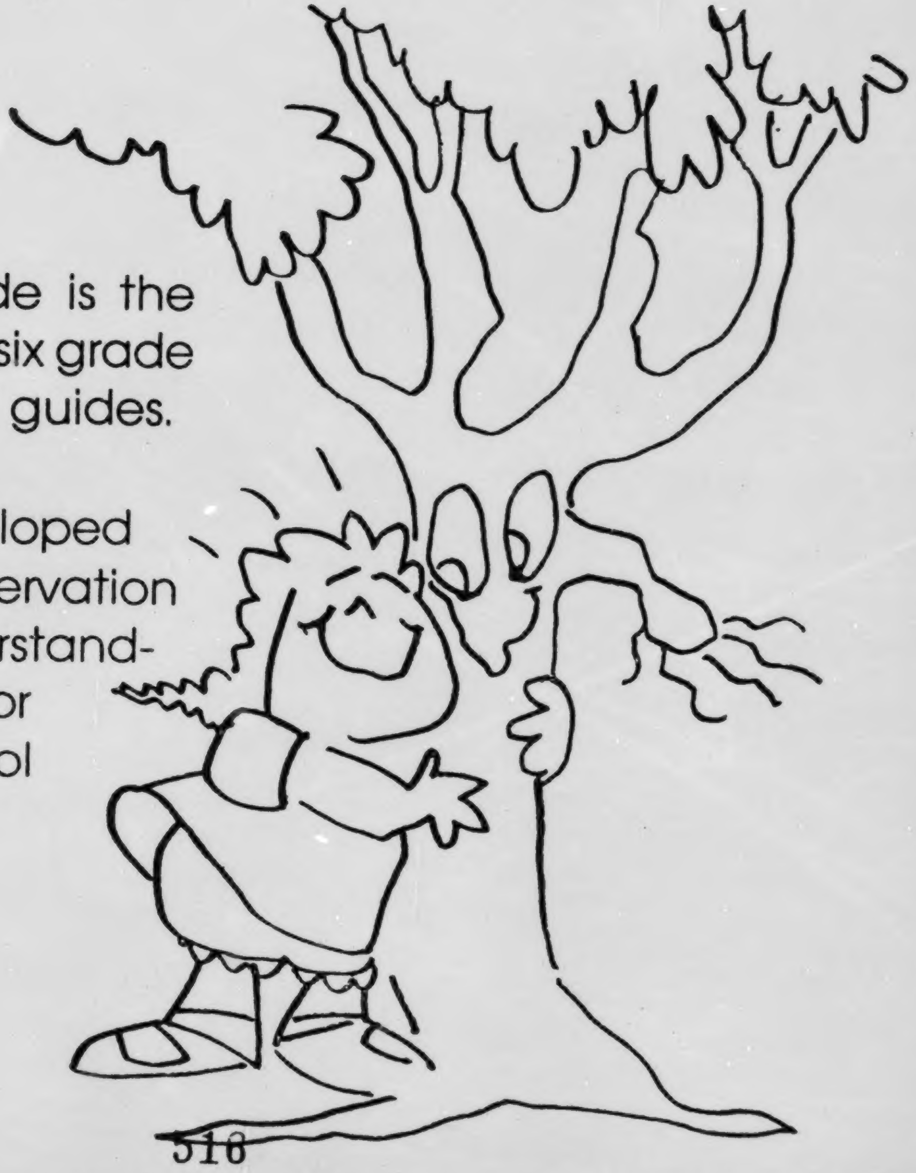
   1. (Prevent waste, don't litter)
   2. (Recycle materials, plant trees)
   3. (Conserve energy, water, natural resources)

10. Complete the sentences with the correct word.

    1. 'Hydro' is a Greek word that means (water).
    2. Energy produced from underground steam and heat is called (geothermal).
    3. Some companies are burning garbage to make (energy, electricity).

Level 5

Conservation For Children



This activity guide is the fifth in a series of six grade level sequenced guides.

It has been developed to promote conservation awareness, understanding and action for elementary school children.

© Cupertino Sch. Dist

An ESEA Title IV-C Project, Number 6298

Produced by Cupertino Union School District

John Muir Elementary School
6560 Hanover Drive
San Jose, CA 95129

(408) 252-5265

Carl W. Krause, Superintendent

Board of Education

Robert D. Hall, President

Severene Bylin

Roger C. Halstead

Valerie Harrison

Claire Hobbs

PROJECT STAFF

State Consultant: William A. Johnson

Associate Superintendent: William Zachmeier

Project Administrator, Principal: Rex Wetzel

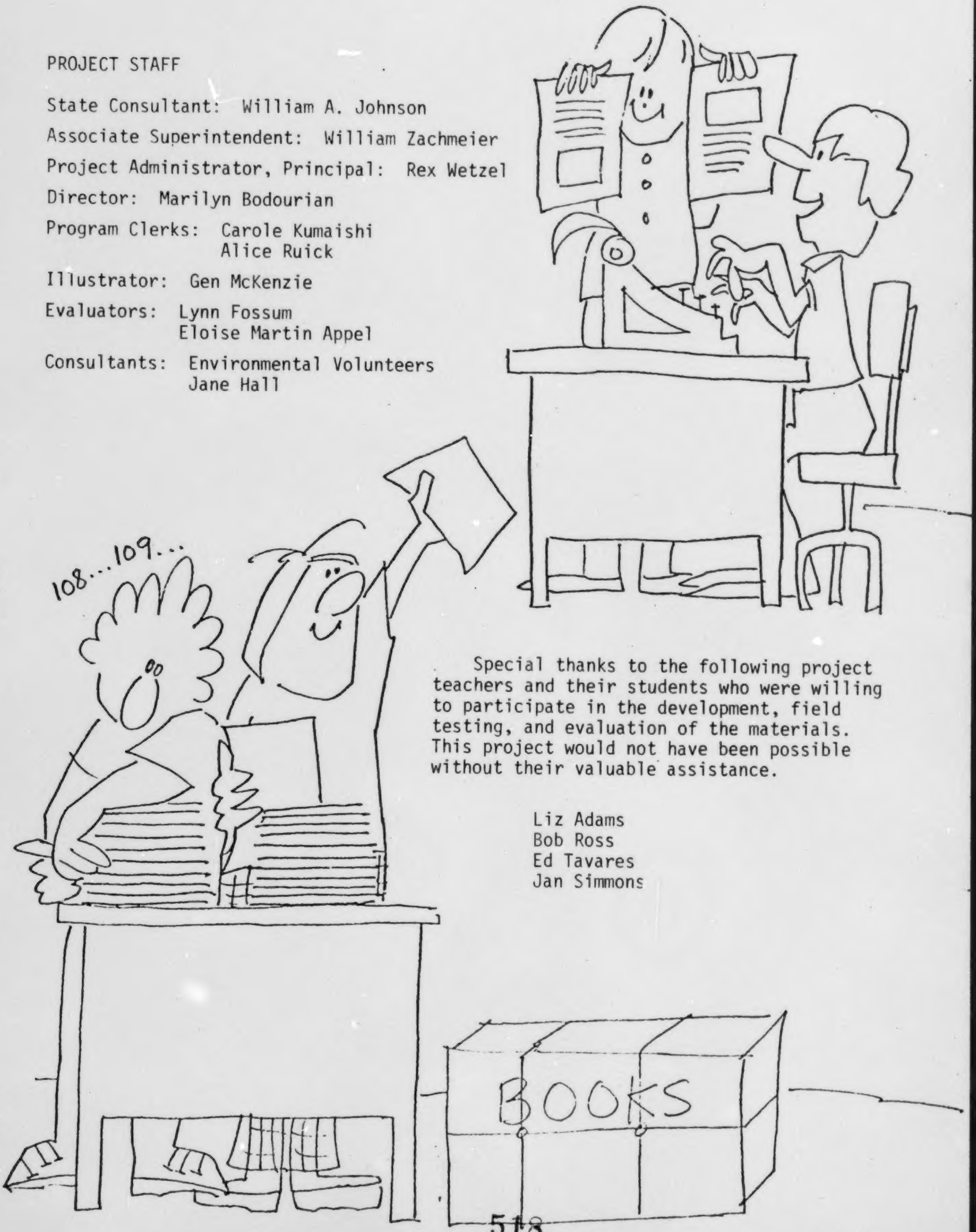
Director: Marilyn Bodourian

Program Clerks: Carole Kumaishi
Alice Ruick

Illustrator: Gen McKenzie

Evaluators: Lynn Fossum
Eloise Martin Appel

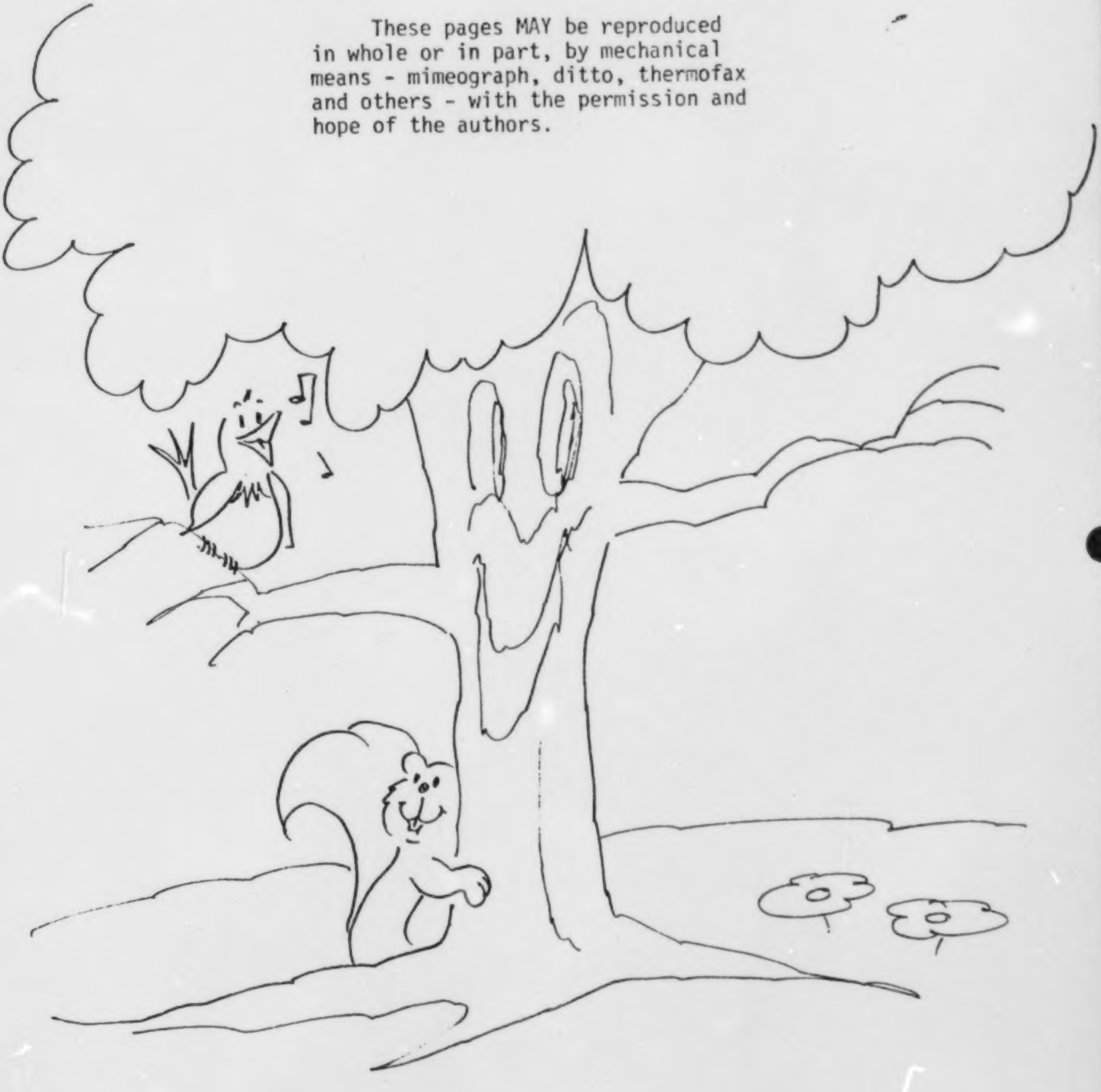
Consultants: Environmental Volunteers
Jane Hall



Special thanks to the following project teachers and their students who were willing to participate in the development, field testing, and evaluation of the materials. This project would not have been possible without their valuable assistance.

Liz Adams
Bob Ross
Ed Tavares
Jan Simmons

These pages MAY be reproduced in whole or in part, by mechanical means - mimeograph, ditto, thermofax and others - with the permission and hope of the authors.



The pages in this book are printed on 100% recycled paper.

TABLE OF CONTENTS

PART 1

Introduction
Purpose, contents, how to use the materials 500

Conservation Concepts .502

Criterion Referenced Test 503

Test-Worksheet Correlation 505

Content Guide 506

PART 2

Student Worksheets

Language Arts 510

Mathematics 550

Social Studies, Science 570

Related Activities 590

APPENDIX

Answers
Student Worksheets
Criterion Referenced Test

INTRODUCTION

PURPOSE:

The CONSERVATION FOR CHILDREN materials were developed to enable teachers to provide relevant conservation information for students in an easy and practical manner.

As our natural resources decline, both in quality and quantity, the importance of conservation education cannot be understated. As children become aware of environmental problems, they can better understand the precedents and consequences of such and their interdependency with the environment. This knowledge will hopefully lead to positive action.

CONTENTS:

Each grade level guide includes:

1. Conservation Concepts -

   These grade level concepts have been determined by teachers to meet the basic interests of students and to correlate with other grade level subject matter.

2. Criterion Referenced Test -

   A student test designed to measure pre and post knowledge of the grade level conservation concepts.

3. Class Record Sheet -

   A recording sheet for teacher use in programming instruction. This page also correlates the test items and student worksheets.

4. Content Guide -

   The guide correlates accepted basic skill objectives and conservation topics. The listing of student worksheets includes

forty pages of language arts activities, twenty pages of mathematics, twenty pages of social studies and science, and ten pages of related activities.

5. Student Worksheets -

   Ninety worksheets which integrate basic skills objectives and conservation information. The worksheet pages were planned and developed by students and teachers and are intended for duplication. They are readily usable in the classroom and require no additional materials, time or space. These worksheets were designed to be relevant, motivating and fun for children.

USING THE MATERIALS:

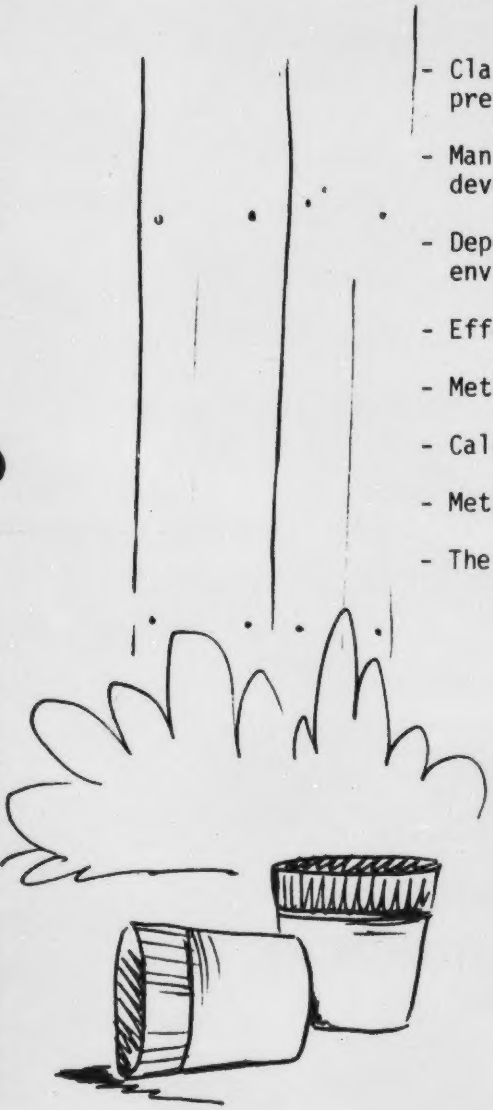
The CONSERVATION FOR CHILDREN materials may be used as a primary resource for teaching basic skills, as supplementary materials to a core program, as enrichment activities, skill review, or as a unit of study.

The worksheets have purposefully not been sequenced or arranged in any order, other than subject area, to encourage teachers to pick and choose those that will meet the needs of their students. Teachers may use the Content Guide to identify basic skills and/or conservation topics for each worksheet. Conservation concepts are covered in each basic skill area and are presented in several worksheets with varying degrees of difficulty. Each worksheet is independent of the others.

The criterion referenced test is included for teachers who want to assess student growth in conservation knowledge. Recording pretest results on the class record sheet will enable teachers to program the materials to meet individual and group needs.

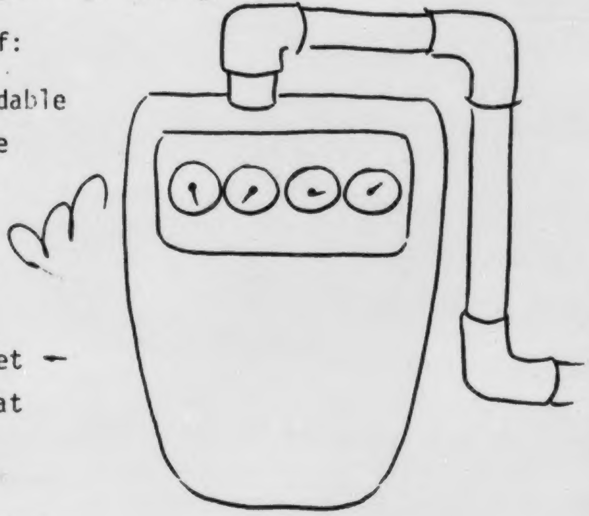
LEVEL 5 - CONCEPTS

CHILDREN WILL LEARN



- Classification of energy sources as to past, present and future.
- Man's use of environmental resources in the development of the United States.
- Dependency of modern man's life style on the environment and natural resources.
- Effects of the environment on people's behavior.
- Methods of conserving energy in the home.
- Calculations using kilowatts, therms and cubic feet.
- Methods of organic gardening.
- The meaning of:

  Biodegradable
  Pesticide
  Obsolete
  Compost
  Kilowatt
  Therms
  Cubic feet
  Thermostat
  R value
  Organic
  Incandescent
  Fluorescent



CONSERVATION FOR CHILDREN
Criterion Referenced Test (5)

Name ____________________________

Date ____________________________

DIRECTIONS: Read the questions. Write your answers on the blank spaces.

1. Name two kinds of energy that were used in the past, are used now, and may be used in the future.

More than 100 years ago	Now	Future
1. ________________	1. ________________	1. ________________
2. ________________	2. ________________	2. ________________

2. Two reasons why we should save energy are:

   1. ____

   2. ____

3. What are three sources of energy that cannot be used up?

   1. ________________ 2. ________________ 3. ________________

4. List four ways of saving energy in the home.

   1. ____

   2. ____

   3. ____

   4. ____

5. The three kinds of fossil fuels are:

   1. ____________________ 2. ____________________ 3. ____________________

6. Name two things that are not biodegradable.

   1. ______________________________ 2. ______________________________

7. List four changes that people have made in the environment.

   1. ____

   2. ____

   3. ____

   4. ____

8. Complete the following sentences.

   1. The fossil fuel most used for cars, trucks, and airplanes is ______________.

   2. The fossil fuel we have the most of is ____________________.

   3. Hydro is a Greek word meaning ____________________.

   4. House meters that measure cubic feet are showing how much ________________ is being used.

   5. The kind of energy that is measured by kilowatts is ____________________.

   6. The energy source used in our homes that is measured in therms is __________.

   7. Gardening that uses only natural materials is called ____________________.

   8. Energy created by underground steam and heat is called____________________.

CONSERVATION FOR CHILDREN

Class Record Sheet
Criterion Referenced Test - Grade 5

Question #	No. right on Pre-test	No right on Post-test	Student Worksheets
1. Name two kinds of energy that were used in the past, are used now, and may be used in the future.			568, 570, 571, 576 577, 578
2. Two reasons why we should save energy are:			510, 539, 543, 553 571
3. What are the three sources of energy that cannot be used up?			547, 571, 577, 578
4. List four ways of saving energy in the home.			525, 537, 538, 543 548, 553, 566
5. The three kinds of fossil fuels are?			513, 521, 522, 523 550, 569, 571, 572
6. Name two things that are not biodegradable.			519, 545, 564, 584
7. List four changes that people have made in the environment.			511, 515, 517, 520 524, 546, 549, 581 582, 585, 587, 588
8. Complete the sentences. 1. The fossil fuel most used for cars, trucks and airplanes is?			522, 574, 575
2. The fossil fuel we have the most of is ?			521, 571
3. Hydro is a Greek word meaning ?			528, 571
4. House meters that measure cubic feet are showing how much ____________ is being used?			543, 557, 558, 565
5. The kind of energy that is measured by kilowatts is ?			543, 560, 561, 562
6. The energy source used in our homes that is measured in therms is ?			
7. Gardening that uses only natural materials is called ?			518, 519, 526, 552 587
8. Energy created by underground steam and heat is called ?			514, 575

Page No.	Skill	Conservation Topic	District Curriculum
Language Arts			
510	Literal comprehension	Conserving energy	
511	Vocabulary development	Environmental changes	
512	Literal comprehension	Insects	
513	Vocabulary development	Fossil fuels	
514	Topic sentence, paragraphs	Geothermal energy	
515	Literal comprehension	Endangered animals	
516	Context clues	Wild animals, pets	
517	Sequencing	Pesticide effects	
518	Literal comprehension	Organic gardening	
519	Literal comprehension	Biodegradable materials	
520	Vocabulary development	Changing farmlands	
521	Context clues	Coal	
522	Context clues	Oil	
523	Verb tense, is-are	Coal	
524	Run-on sentences	Garbage	
525	Types of sentences	Conservation methods	
526	Acrostic, vocabulary	Organic gardening	
527	Table of Contents	Energy	
528	Dictionary, usage	Hydro	
529	Spelling	Vocabulary	
530	Complete subject, predicate	Water	
531	Dictionary guide words	Vocabulary	
532	Library cards	General	

Page No.	Skill	Conservation Topic	District Curriculum
533	Capitalization	Student action	
534	Following directions	General	
535	Punctuation	Electricity	
536	Contractions	Fossil fuels	
537	Verb tense	Conservation, lighting	
538	Compound words	Home conservation	
539	Homonyms	Energy sources	
540	Synonyms	Pesticide resistance	
541	Vocabulary development	General	
542	Spelling	Vocabulary	
543	Vocabulary development	Conservation methods	
544	Alphabetical order	Vocabulary	
545	Spelling, mis-	Ecological shopping	
546	Pronouns	Pollution	
547	Adjectives	Energy sources	
548	Adverbs	Conservation methods	
549	Fact or fantasy	Conservation methods	
Math			
550	Addition, 3 digit	Fossil fuels	
551	Decimals, multiplying	Water measurement, gallons	
552	Addition, money	Organic gardening	
553	Expanded notation	Home energy conservation	
554	Word problems, division	Water usage	
555	Multiplying, money	Appliance cost	

Page No.	Skill	Conservation Topic	District Curriculum
556	Division, measurements	Garden planning	
557	Division, measurements	Water usage	
558	Decimals, multiplying	Cubic feet	
559	Fractions, addition	General	
560	Fractions, multiplying	Kilowatt cost	
561	Decimals, multiplying	Kilowatt cost	
562	Interpreting pictorial data	Reading electric meters	
563	" (worksheet) "	"	
564	Number facts, review	Biodegradable	
565	Subtraction, 6 digits	Water meters	
566	Measurement	Water waste	
567	Roman numerals	Wood products	
568	Graphs	Sources of energy	
569	Graphs	Fossil fuels	
Social Studies/Science			
570	Critical thinking	Sources of light	
571	Critical thinking	Energy sources	
572	Diagrams	Fossil fuel formation	
573	Interpreting cartoons	Fossil fuels	
574	Decoding	Fossil fuels	
575	Critical thinking	Oil	
576	Literal comprehension	Ocean energy	
577	Pictorial data, interpreting	Thermometers	
578	Literal comprehension	Wind power	

Page No.	Skill	Conservation Topic	District Curriculum
579	Literal comprehension	Electricity	
580	Critical thinking	Electricity	
581	Factual knowledge	American inventors	
582	Interpretive comprehension	Conservationists	
583	Decoding	American inventors	
584	Decoding	Biodegradable	
585	Literal comprehension	Pollution	
586	Interpretive comprehension	Minerals	
587	Literal comprehension	Pesticides and poisons	
588	Sequencing	Wildlife destruction	
589	Categorization	General	
Related Activities			
590	Introduction		
591	Arts and Crafts	Wind Chimes	
592	Arts and Crafts	Snow Jars	
593	Arts and Crafts	Crystal Gardens	
594	Growing Plants	Peanuts	
595	Growing Plants	Sacks of Potatoes	
596	Music	"This Land Was Made For You and Me?"	
597	Send Aways	Conservation materials	
598	Send Aways	More About Peanuts	
599	Student bibliography	Conservation books, fact and fiction	

Name ____________________

DIRECTIONS: Read the story to answer the questions at the bottom of the page.

The Energy Crisis

For the past century, our country has depended mainly on fossil fuels to provide for our energy needs. Valuable fossil fuels, such as natural gas and low sulphur oil, are used to generate electricity in most parts of the country. Even though we have a large amount of our own natural resources, we are now using so much that we have to import some of these fuels from other countries. If we continue to use up these fuels at our present rate, they will soon be gone.

Other fuels for generating electricity must be found. Utilities, industry, and the government are working to find new fuels and to develop other ways of generating electricity. But, this takes time and is costly.

In the meantime, we can all help to less the crisis by using less energy. It is up to each of us to be "waste watchers" and make certain we and our families are using energy efficiently and wisely.

One reason to conserve energy is to preserve our natural resources for future generations. Another important reason is to help our country to be self-sufficient and not have to rely on fuels from other countries. A third reason is to lower our monthly utility bills. By using less electricity at home, we can save money and energy too.

List three reasons why people should try to conserve energy.

1. ____________________

____

2. ____________________

____

3. ____________________

____

Name ______________________________

DIRECTIONS: Use the words in the box to fill in the blank spaces in the story. Read the story again to be sure it makes sense.

future shortages civilization cleared solutions

relatively consequences abundance cultivated plentiful

Man and His Environment

Although man has been on the earth for a ________________________ short time, he has caused many changes in the environment.

He has ________________________ some of the wild plants to use for food, clothing, and building materials. He has tamed wild animals for food, clothing, pets, and for transportation. Man has ________________________ large forest areas to make room for cities, roads, and to supply materials for building needs. He has searched the earth for minerals and oil and refined them for use as fuel, materials for housing and industry, and tools and machinery for our growing population.

Man has built a great ________________________ using the natural resources of the environment. But until recently, he has given little thought to the ________________________ of the changes he was making. At first, there was a great ________________________ of natural resources. There was so much land and food available that man had no thought of any ________________________. Wildlife was ________________________ and clean air and water could be found almost anywhere.

Now we are aware that many of these natural resources are limited. We know that we must use greater care and thought as to how we use them. The growing problems of population, pollution, and poisons are important for us to understand in order for us to find ________________________. The ________________________ of our environment depends on us.

Name ______________________________

Garden Pests ?

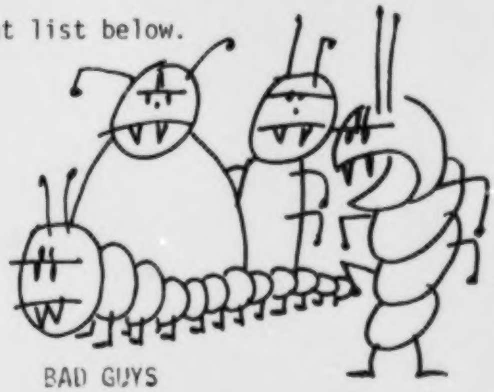
All gardens have bugs, or insects. They are part of nature's food chain. In a small garden, the best way to get rid of bugs that are eating your plants is to hunt them down and remove them by hand. Smaller insects can be destroyed with a bath of soapy water which will not hurt your plants. Another way to get rid of bad bugs is to use good bugs. Many bugs depend on other bugs for food. Poisons or insecticides should be avoided because they kill the good bugs as well as the bad ones.

Insects can be divided into two main groups - the kind which mainly eat plants (the bad guys) and the kind which mainly eat other bugs (the good guys). Learning the difference between the good guys and the bad guys can help your garden.

Caterpillars, slugs, and cutworms are plant eating insects. They can eat the tender, young leaves of your plants almost as fast as you can. Aphids and spider mites suck the juices from plants. You can often find them on the undersides of plant leaves. Ladybugs and lace wings are insects that like to eat aphids and spider mites. A single ladybug can eat fifty aphids a day! Praying mantis and garden spiders also catch many harmful insects. Ground beetles are very good at getting rid of slugs, caterpillars and cutworms.

Put the insects you've read about in the right list below.

GOOD GUYS



BAD GUYS

______________________   ______________________

______________________   ______________________

______________________   ______________________

______________________   ______________________

______________________   ______________________

Name ______________________________

DIRECTIONS: Use the words in the box to fill in the blank spaces in the story. Read the story again to be sure it makes sense.

rise pipelines dug refineries animals pumped
beaches fossil result coats tankers drilling
accident problem periods coal

Oil, coal and natural gas are ____________ fuels that are found deep under the ground. Coal mines are ____________ into the ground to remove the ____________. Natural gas and oil are obtained by ____________ wells to reach the underground supply. Natural gas tends to ____________ by itself and can be easily transported through ____________. Oil, or crude petroleum, must be ____________ up and separated into its various parts in ____________. Oil can be transported across country by pipeline or overseas in huge ocean ____________.

If an ____________ occurs in transporting the oil across the oceans or as a result of offshore drilling, oil spills may ____________. The spilled oil ____________ the water for miles around. It kills birds and sea ____________ and can make ____________ useless for recreation for long ____________. Oil pollution is a ____________ on many coastlines.

Name ______________________________

GEOTHERMAL ENERGY

(1) Geothermal energy comes from water heated by molten rock many thousands of feet beneath the earth's surface. Until now it has been only available in areas where reservoirs of underground water exist naturally. The PG&E Company operates such an energy plant in the geyser area north of San Francisco.

(2) Many other countries have had success in using geothermal power. Mexico, Italy, New Zealand, and Iceland all have geothermal energy plants in use. In Iceland, geysers and hot springs are a common sight. The people there have used this energy source to produce large amounts of food in naturally heated greenhouses.

(3) Scientists think that they are finding ways to use geothermal energy in other areas too. They are drilling into hot, dry underground areas, pumping in cold water, and letting the earth heat the water. They are presently trying this method in New Mexico. If they are successful, geothermal energy plants could be built anywhere that hot, dry rock is available within 25,000 feet of the earth's surface.

(4) Some scientists are concerned that the cracking and disturbance to the underground rock could create earthquakes. They are also worried that by using the underground water we might change the earth's surface. Another problem involves the strong minerals contained in the underground water which could ruin machinery.

(5) Most people, however, are in favor of geothermal energy because it does not add pollutants to the air. It is one of nature's clean sources of natural energy.

DRAW A LINE UNDER THE BEST TOPIC SENTENCE FOR EACH PARAGRAPH

Paragraph 1

1. There are many geysers north of San Francisco.
2. Geothermal energy has been limited to natural geyser areas.
3. The PG&E is a power company.

Paragraph 2

1. Many countries are developing geothermal power.
2. There are numerous geysers in Iceland.
3. Greenhouses can be heated with geothermal energy.

Paragraph 3

1. Hot, dry rock is available in New Mexico.
2. Energy plants can be built 25,000 feet beneath the earth's surface.
3. New ways to expand geothermal energy are being sought.

Paragraph 4

1. There are problems to be solved in using geothermal energy.
2. Geothermal energy might cause earthquakes.
3. Underground water contains many minerals.

Paragraph 5

1. Everyone likes geothermal energy.
2. Geysers are very popular.
3. Geothermal energy is a non-polluting power source.

Name ______________________________

Endangered Species

While most animals are safe, too many are extinct or in danger of becoming extinct. It is a good idea to remember that animals can live without man, but man cannot live without animals. To tell how safe or in danger our animals are, the following descriptions are used.

SAFE - An animal whose population is steady or even increasing. Nothing seems to be threatening it.

THREATENED - A species whose numbers are low because of pollution, habitat destruction or over-hunting. It could start dying out if it is not protected.

ENDANGERED - Those animals whose population has gone down so much that they are in great danger of dying out. Even with protection it may not survive.

EXTINCT - Those species that have died out either from natural causes or because of man.

The grizzly bear is one of the most powerful animals in the world. But man is threatening it by killing it and destroying its wilderness habitat.

Because of man the passenger pigeon is now extinct. But many prehistoric animals became extinct before man appeared on earth.

There are not as many Rocky Mountain bighorn sheep now as there have been because man's livestock has taken over many of their grazing areas. At present this animal is thought to be safe.

The peregrine falcon and the southern bald eagle are endangered because of pesticides, loss of habitat and illegal killing.

Packs of timber wolves once hunted all over North America. Now certain kinds are endangered because man has killed many of them and destroyed their habitats.

Write safe, threatened, endangered or extinct in the blank spaces.

1. The peregrine falcon is ______________________________.
2. The passenger pigeon is ______________________________.
3. The grizzly bear is ______________________________.
4. The Rocky Mountain bighorn sheep is thought to be ________________.
5. The southern bald eagle is ______________________________.
6. Timber wolves are ______________________________.

Name ______________________________

DIRECTIONS: Read the story. Use the context clues to match the underlined words to their definitions at the bottom of the page.

Letting Wild Animals Go

Some people have tamed wild animals to be pets. Raccoons, tortoises, snakes, and many types of birds are some of the animals that are often kept as pets. Many well-meaning people who have these wild animals feel that they should let their pets go free to return to their natural habitats. This should not be done for several reasons:

1. Research shows that a captive has has less than a 10% chance of surviving the demands of his natural habitat. The soft life of captive living makes it difficult for animals to adapt to their wild habitats.
2. Captive pets can have or transmit diseases to the other wild animals.
3. The food supply of an area may not be enough to support another animal. Adding your pet to the habitat is another way of upsetting the 'balance of nature.

The best thing to do if you cannot keep your pet is to give it to someone who will care for it. Do not turn it loose!

Write the letter of the definition in front of the correct word.

_____	habitats	A - caged or contained in an unnatural setting
_____	research	B - needs, requirements
_____	captive	C - surroundings, home of an animal
_____	surviving	D - pass on to, infect
_____	demands	E - fit into different conditions or settings
_____	adapt	G - staying alive
_____	transmit	H - studies of past events or facts, investigations
_____	upsetting	I - disrupting, disturbing, changing

Name ______________________________

How can a farmer harm pelicans that live five hundred miles away from him?

Farmers grow most of the food that we eat today. They often use pesticides to kill harmful insects that destroy their crops. Many times these pesticides kill other animals, too.

First, the farmer sprays his crops with the pesticides to kill the insects. When it rains, the pesticides are washed into creeks and rivers. These pesticides cling to tiny plants in the water that are eaten by fish. As the river is flowing to the ocean, some of these fish are eaten by bigger fish. The big fish are then eaten by birds, such as pelicans.

The pesticides can cause changes inside the pelicans' body. They cause the pelicans to lay eggs that have very thin shells. Sometimes the eggshells are so thin that they break when the mother or father pelican sits on the nest. In 1969, six hundred pairs of pelicans on Anacapa Island, off the coast of California, were able to hatch only five babies. And in 1970, only one egg was hatched. If no baby pelicans are born, soon all the pelicans will be gone.

Put numbers in front of the sentences to show the order in which they happen.

______ Birds, such as pelicans, eat the fish.

______ Pesticides drain into creeks and rivers.

______ The pesticides cause changes in the pelicans' body.

______ The farmer sprays his crops with pesticides to kill the insects.

______ The pesticides stick to tiny water plants and are eaten by fish.

______ No baby pelicans are born.

Name ______________________________

How to be an ORGANIC Gardener

Organic gardening is 'natural' gardening. It means putting more into the soil than you take from it.

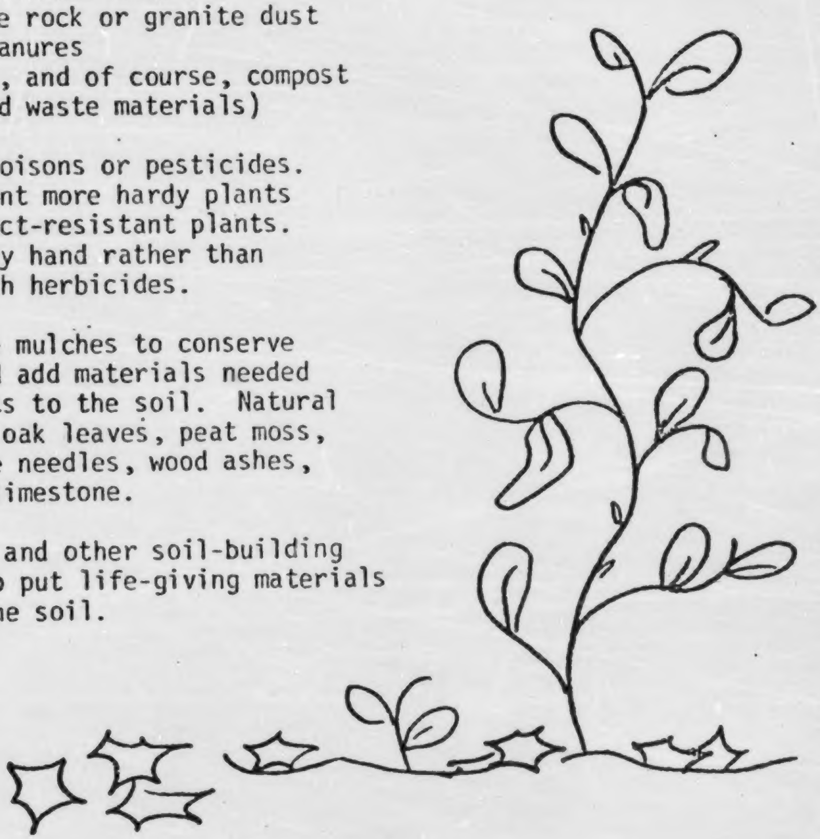
To become a good 'organic' gardener you must know the rules.

Rule 1. Use natural fertilizers rather than artificial fertilizers. Some good natural fertilizers are:
- phosphate rock or granite dust
- animal manures
- minerals, and of course, compost (recycled waste materials)

Rule 2. Do not use poisons or pesticides. Instead, plant more hardy plants or more insect-resistant plants. Pull weeds by hand rather than spraying with herbicides.

Rule 3. Learn to use mulches to conserve moisture and add materials needed by the plants to the soil. Natural mulches are oak leaves, peat moss, decayed pine needles, wood ashes, or crushed limestone.

Rule 4. Use compost and other soil-building materials to put life-giving materials back into the soil.



Test your knowledge. Answer the questions 'true' or 'false'.

1. Organic gardening is good for the soil. ____________________
2. Organic gardeners use insecticides to control bugs. ____________________
3. Mulches, like oak leaves, help to keep the soil moist. ____________________
4. Compost is a natural fertilizer. ____________________
5. Herbicides are used by organic gardeners to get rid of weeds. ____________________

Name ______________________________

Here are some new words to learn.

Biodegradable: material that is able to be readily decomposed (dissolved or broken down) by biological means, especially bacterial action.

Natural resource: the wealth of materials supplied to us by nature, such as coal, oil, water power, rich soil, etc.

Organic: involving the basic makeup of a thing. When used with gardening it means grown with only animal or vegetable fertilizers like manure, compost, etc.

Use the correct word in the sentences.

1. The wood from trees in our forests is a __________________________.

2. Using eggshells and coffee grounds in our gardens is a way of _______________________ gardening.

3. Plastic will not dissolve so it is not __________________________.

4. Minerals in the earth are another __________________________.

5. Most papers will dissolve easily, so we know they are ______________ ______________________________.

See how many animal names you can make out of the letters in the word:

BIODEGRADABLE

_____________   ____________________   ____________________

_____________   ____________________   ____________________

More?

Name ______________________________

DIRECTIONS: Read the story. Below the story are some new words. Draw a line from the word to its meaning.

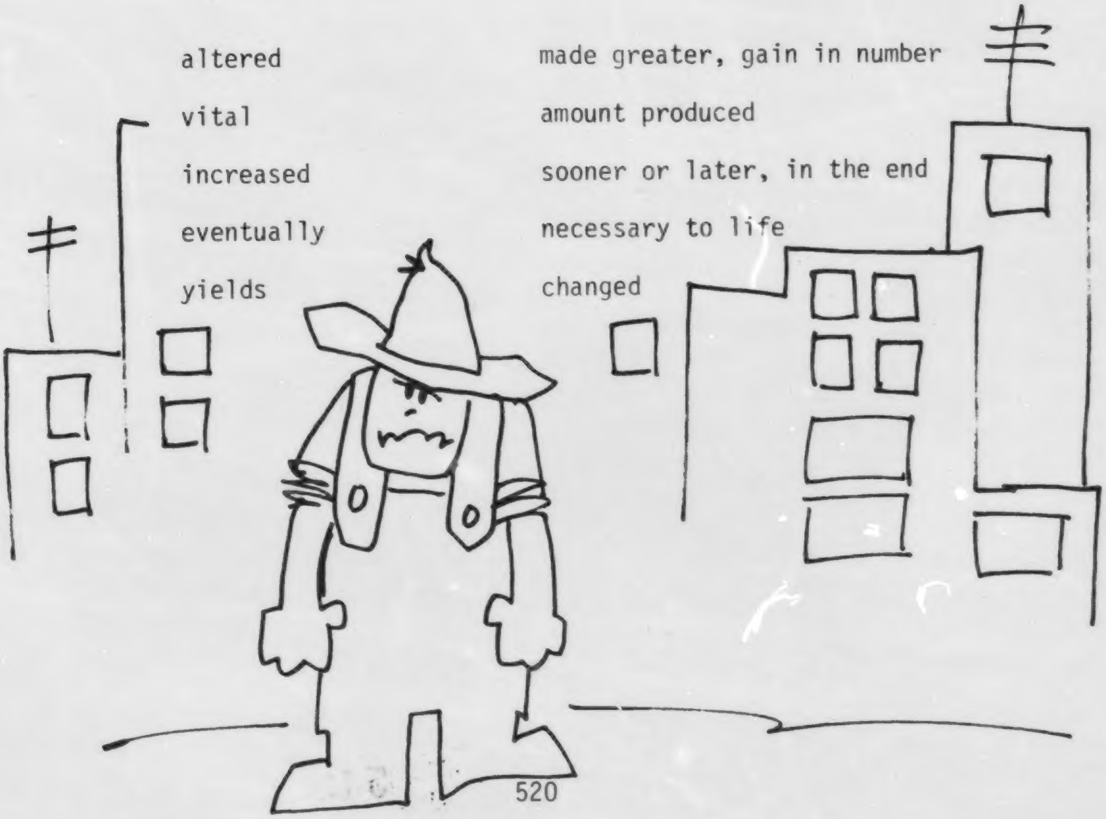
Our Changing Farmlands

The United States loses approximately three million acres of land a year to new houses, industry, parking lots and roads. Much of this land was once used for growing food.

Today the central valley of California is still farming land, but the style of farming has altered. The small farmer, who was once a proud and vital part of our nation, is finding it harder and harder to survive. The lands around him are slowly being sold to housing developers. Developers like to build houses on flat farmlands because it is easier and cheaper to build there than on hillsides. As the houses are built and sold, the land prices begin to rise. Property taxes are also increased. The small farmer often finds that his crops do not sell for enough money to pay the increased taxes.

More and more small farmers eventually sell their lands to the housing developers or to large corporate farms. Corporate farms are owned by large companies that often pay less taxes than individual farmers. They also can increase the crop yields through the use of extensive machinery. It is estimated that 60% of all farmland in the United States is now owned by corporations.

altered	made greater, gain in number
vital	amount produced
increased	sooner or later, in the end
eventually	necessary to life
yields	changed



Name ______________________________

DIRECTIONS: In each sentence there is an underlined word that you may not know. Use clues in the sentence to decide what the word means. Circle the word below the sentence that means almost the same as the underlined word.

1. Until 1970 almost all furnaces and engines were powered by fossil fuels.
   chairs heaters automobiles people

2. These fossil fuels include coal, petroleum, and natural gas.
   dogs minerals oil rocks

3. Of these three, coal is the one that has been utilized the longest.
   used produced sold saved

4. Of all the fossil fuels, coal reserves are the most plentiful.
   largest cleanest cheapest easiest

5. It is also the most extensively used fuel today.
   best widely costly safely

6. There are disadvantages in using coal as fuel.
   gains reasons benefits problems

7. Coal mining is a dangerous occupation.
   trip job risk company

8. Making mines safe for workers is expensive and lowers the owners' profits.
   hard cheap impossible costly

9. Transportation of coal is cumbersome and slow.
   cold fast bulky easy

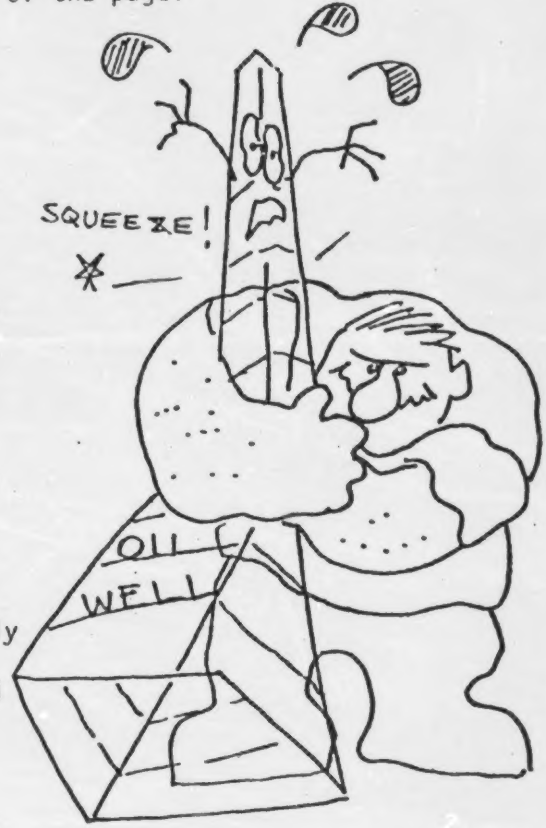
10. Heaps of waste materials near mines can turn green countrysides gray and ugly.
    packages piles litter conservation

11. Burning coal often creates air pollution.
    produces lessens blackens traps

12. For these reasons, many areas are looking for other alternatives.
    places choices population decisions

Name ______________________________

DIRECTIONS: Read the story. Use the context clues to match the underlined words to their definitions at the bottom of the page.



OIL

In the past years we have put most of our fuel burden (74%) on oil and natural gas. They took millions of years to make, are in limited supply, and are becoming harder to find.

Production of oil in the United States hit a high point in 1970 (11.3 million barrels a day). Since then, our output has declined. Even with discoveries of major new oil fields in Alaska and offshore, production won't return to the peak levels of the past. At best, it will stabilize for a number of years. Sooner or later our oil resources will start to wane.

Petroleum (processed oil) is especially important since it is the dominant fuel today for cars, trucks and airplanes. Oil is also vital in the manufacture of many products such as fertilizers, fibers, plastics and pharmaceuticals.

Write the letter of the definition in front of the correct word.

_____ burden

_____ limited

_____ output

_____ peak

_____ wane

_____ dominant

_____ vital

_____ stabilize

A - necessary, could not do without

B - highest

C - load, demand

D - decrease, lessen

E - leading, most important

F - production

G - only so much, not everlasting

H - steady, become even

Name ______________________________

DIRECTIONS: Write is or are in the blank spaces.

1. Coal __________ another source of energy.

2. Coal, oil, and natural gas __________ fossil fuels.

3. About 19% of our energy __________ supplied by coal.

4. Black, sooty smoke from burning coal __________ a big source of air pollution.

5. People __________ concerned that the heat from burning coal will change our climate.

6. "Acid rains" __________ created when coal smoke mixes with moisture in the air.

7. Plants and animals __________ endangered by these acid rains.

8. "Stack gas scrubbers" __________ machines used to clean the gases produced by burning coal.

9. It __________ very expensive to clean coal gases.

10. At present usage rates, there __________ enough coal in the United States to last for 500 years.

Name ___________________________________

DIRECTIONS: The following story about garbage is all mixed up. It needs periods (.) to end the sentences. Put the periods where they belong and be sure to use a capital letter to begin the next sentence.

The Great Garbage Story

Garbage is a problem people who try to solve this problem call garbage by a special name - solid waste solid waste won't go away by itself it can't disappear into water or air picking it up and taking it away is one of the most important jobs that city workers do

Solid waste wasn't always such a big problem people in the "olden days" didn't have so much to throw away they grew their own fruits and vegetables they killed animals for meat they didn't shop in stores, so they didn't have a lot of packages.

The people then made their own containers out of clay and plants they used them over and over they made simple, sturdy furniture to last for a long time worn-out clothes were made into rugs and quilts left-over food was eaten by the animals people long ago had no need for huge garbage cans

But some things were thrown away for example, when clay bowls broke, they became solid waste they were thrown away in open dumps at first, dumps were small but as people settled down and built towns and cities, dumps became larger and larger the first garbage men began to go from house to house with carts and horses solid waste began to be a real problem

Today each of us throws away about four pounds of garbage every day that adds up to 400,000 tons a day in the whole country almost all of it is dumped in the same way it was in the "olden days" only our dumps are much much bigger there are many more people today and each of us throws away more and more garbage each year

Name ______________________________

DIRECTIONS: Write 'statement', 'command', or 'question' in front of each sentence below. Put an X on the space if it is not a sentence. Be sure to complete sentences with the correct punctuation.

________________ 1. Ways to save energy at home

________________ 2. Turn off TV, stereo or radio when no one is listening or watching

________________ 3. You shouldn't use your television set to keep you company or put you to sleep

________________ 4. Standing with the refrigerator door open while you decide what you want

________________ 5. How does covering pots with lids shorten cooking time

________________ 6. Run dishwashers only with full loads

________________ 7. Planting trees outside will shade your house and keep it cooler

________________ 8. Turn lights off when you leave a room

________________ 9. Why will washing clothes in cold water save energy

________________ 10. Hanging clothes to dry on outside clotheslines on sunny days

________________ 11. Taking short showers instead of baths will save water and energy too

________________ 12. Close draperies during hot summer days to keep the heat out and the cool air in

Name ______________________________

DIRECTIONS: Complete the sentences. Use the clue words to answer the riddle.

1. Using only natural materials in growing things is called organic $\frac{G}{2}\ \frac{A}{7}\ \frac{R}{13}\ \frac{D}{3}\ \frac{E}{12}\ \frac{N}{14}\ \frac{I}{6}\ \frac{N}{14}\ \frac{G}{2}$.

2. Organic gardeners do not use $\frac{\quad}{1}\ \frac{\quad}{12}\ \frac{\quad}{10}\ \frac{\quad}{5}\ \frac{\quad}{6}\ \frac{\quad}{4}\ \frac{\quad}{6}\ \frac{\quad}{3}\ \frac{\quad}{12}\ \frac{\quad}{10}$

3. They use insects and birds to control $\frac{\quad}{16}\ \frac{\quad}{11}\ \frac{\quad}{2}\ \frac{\quad}{10}$.

4. They also pull out weeds by $\frac{\quad}{9}\ \frac{\quad}{7}\ \frac{\quad}{14}\ \frac{\quad}{3}$.

5. Vegetable peelings, eggshells and other food wastes can be used to make $\frac{\quad}{4}\ \frac{\quad}{17}\ \frac{\quad}{8}\ \frac{\quad}{1}\ \frac{\quad}{17}\ \frac{\quad}{10}\ \frac{\quad}{5}$.

6. Materials used to cover the ground and keep it moist are called

$\frac{\quad}{8}\ \frac{\quad}{11}\ \frac{\quad}{15}\ \frac{\quad}{4}\ \frac{\quad}{9}\ \frac{\quad}{12}\ \frac{\quad}{10}$.

7. Compost adds life giving materials back into the $\frac{\quad}{10}\ \frac{\quad}{17}\ \frac{\quad}{6}\ \frac{\quad}{15}$.

8. Many people feel organic gardening is better for our

$\frac{\quad}{12}\ \frac{\quad}{14}\ \frac{\quad}{18}\ \frac{\quad}{6}\ \frac{\quad}{13}\ \frac{\quad}{17}\ \frac{\quad}{14}\ \frac{\quad}{8}\ \frac{\quad}{12}\ \frac{\quad}{14}\ \frac{\quad}{5}$.

WHAT IS THE BEST WAY TO RAISE CARROTS?

$\frac{G}{2}\ \frac{\quad}{13}\ \frac{\quad}{7}\ \frac{\quad}{16}\quad \frac{\quad}{5}\ \frac{\quad}{9}\ \frac{\quad}{12}\quad \frac{\quad}{5}\ \frac{\quad}{17}\ \frac{\quad}{1}\ \frac{\quad}{10}\quad \frac{\quad}{7}\ \frac{\quad}{14}\ \frac{\quad}{3}$

$\frac{\quad}{1}\ \frac{\quad}{11}\ \frac{\quad}{15}\ \frac{\quad}{15}$!

Name ______________________________

Read the Table of Contents

Table of Contents

Energy Sources, past and present
    Fossil Fuels 6
    Water, Sun and Wind 12

Future Energy Sources
    Nuclear 14
    Solar 19
    Tidal 22
    Geothermal 24
    Others 26

Who Needs Energy?
    Industry 34
    Agriculture 51
    Home Requirements 63

Conservation Methods for Everybody
    Protecting the Environment 80
    Changing Life Styles 94

Between what papges will you find information the following subjects?

Subject — Between page ? and page ?

1. Energy requirements of lumber and oil companies. ______ ______
2. Present uses of oil, coal and natural gas. ______ ______
3. How electricity is used in the home. ______ ______
4. Problems with reactors and radioactive waste material storage. ______ ______
5. Environmental laws to protect forests or wild rivers. ______ ______
6. Methods of getting energy from sewage and solid waste. ______ ______
7. Pioneer uses of windmills and waterwheels. ______ ______
8. New ideas for housing and transportation. ______ ______

Name ______________________________

WHAT IS WATER?

Water is a combination of two colorless gases - two parts or atoms of hydrogen and one part or atom of oxygen. That makes the chemical formula of "H_2O".

"Hydro" is from a Greek word meaning water. Any English word having "hydro" or "hydra" in it has to do with water in some way.

Use your dictionary to find the meanings of the following words:

Hydrophobia: ______________________________

Hydroplane: ______________________________

Hydrant: ______________________________

Hydroelectric: ______________________________

Hydrography: ______________________________

Hydroponics: ______________________________

Hydrotherapy: ______________________________

Hydrosphere: ______________________________

Name ______________________________

DIRECTIONS: Unscramble the words in CAPITAL letters. Write your answers on the blank spaces.

1. Gardening without using pesticides is called CANIGOR.

__ __ __ __ __ __ __ __

2. R-value (resistance to heat-flow) is used in measuring the effectiveness of SUINTALOIN. __ __ __ __ __ __ __ __ __ __ __

3. Decaying materials used by gardeners to enrich the soil is called STOPMOC. __ __ __ __ __ __ __

4. DUES items can often be recycled. __ __ __ __

5. The best way to save our natural resources is to ER-UES products.

__ __ - __ __ __

6. We need energy to power our CHANIMSE. __ __ __ __ __ __ __ __

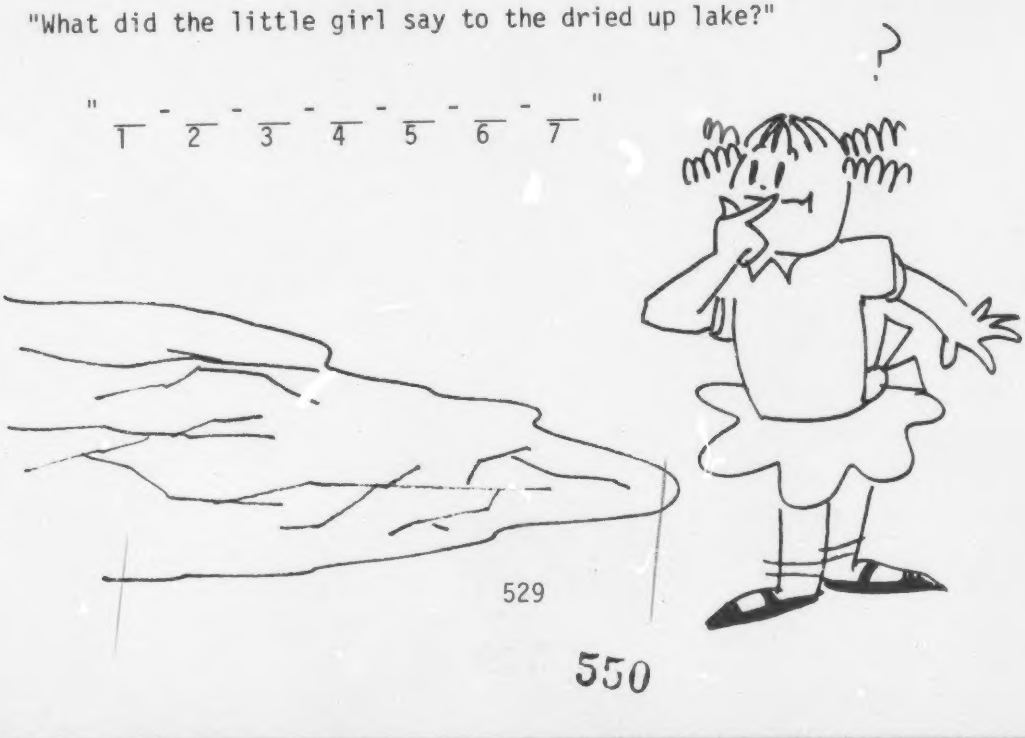
7. You can save energy in your home by turning down the OHRESTTTAM.

__ __ __ __ __ __ __ __ __ __

Write the first letter of each word to find out:

"What did the little girl say to the dried up lake?"

" __ - __ - __ - __ - __ - __ - __ "
1 2 3 4 5 6 7



Name ______________________________

DIRECTIONS: Draw one line under the complete subject.
Draw two lines under the complete predicate.

1. The total amount of water on the earth has not changed in the last 570 million years.
2. The water cycle is a continuous circle.
3. About 97% of all the earth's water is in the oceans.
4. Approximately 2% of the earth's water is locked in the polar ice caps.
5. Only 1% of the earth's water is fresh and available for human use.
6. The average person drinks about 145 gallons of water a year.
7. Man could not live more than five days without water.
8. Industry uses about 52% of our water in the United States.
9. Crop irrigation in the United States takes about 41% of our water.
10. The remaining 7% is used in homes, schools, and offices.
11. Our water is not as pure today as a hundred years ago.
12. Water pollution is a big problem for everyone.

Name ______________________________

DIRECTIONS: Use the dictionary guide words to list the following words on the correct pages below. Remember to write the words in alphabetical order.

population
predator
petroleum
pesticide
pollution
phosphates
poison
power
parasite
plant

palm 423 plenty

____

____

____

____

____

plump 425 prepare

____

____

____

____

____

Use the same words to complete the sentences.

1. ______________________________ is another word for oil.

2. Air and water ______________________________ are problems for our environment.

3. A ______________________________ is an animal that hunts other animals for food.

4. The number of people in a city is called the ______________________________.

Name ______________________

1.

ENVIRONMENTAL EDUCATION

614.7 The environment and you
B Brennan, Matthew
Grosset & Dunlap 1972
60 p. illus.

1. Pollution 2. Environmental Educ.
3. Title

2.

333.7 ENVIRONMENTAL EDUCATION
M

Miles, Betty
Save the earth! An
ecology handbook for kids.
Knopf 1968
91 p. illus photos

1. Environmental Educ. 2. Conservation
3. Pollution I. Title II. Subtitle

Use the library cards to answer the following questions.

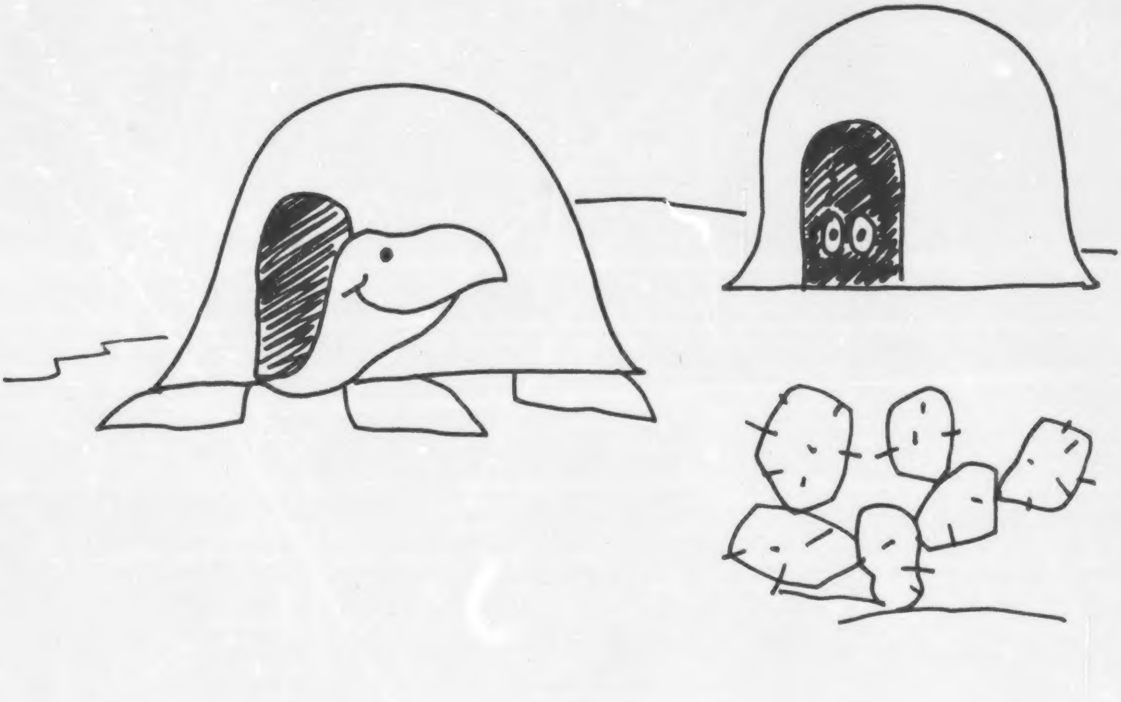
1. Who is the author of book 1? ______________________
2. What is the title of book 1? ______________________
3. When was book 1 published? ____________
4. What is the library call number of book 1? ____________
5. What is the title of book 2? ______________________
6. Who is the publisher of book 2? ______________________
7. What is the library call number of book 2? ____________
8. Which book is illustrated with photographs? ______________________
9. Which book has the most pages? ______________________
10. Which book was most recently published? ______________________

Name ____________________

DIRECTIONS: Read the story. Circle all the words which should begin with capital letters.

mr. dewitt hogle's 6th grade class at bubb school in mountain view succeeded in getting the desert tortoise designated the california state reptile. in 1972 the students, mr. hogle and parents worked very hard to get their assemblyman to introduce the bill and to push it through the state legislature. in addition to being successful with their project, the class learned about the legislative process firsthand.

the desert tortoise is fully protected by state law, in addition to being the state reptile. this means in california that it is illegal to remove a tortoise from its natural home and that it is illegal to sell a tortoise. by law all captive desert tortoises in california must be registered with the california department of fish and game. application forms are available from the california department of fish and game, 1416 ninth st., sacramento, california, 95814.



Name ______________________________

DIRECTIONS: Solve these riddles by answering the questions correctly.

Riddle: WHAT THREE LETTERS MAKE EVERYTHING GO???

_____ If oil, coal, and natural gas are fossil fuels, put N. If not, put B.

_____ If America produces all the oil it needs, put O. If not, put R.

_____ If coal is the fossil fuel that we have the most of, put G. If not, put O.

Riddle: WHAT CAN YOU SEE WHEN IT IS NOT SMOGGY IN LOS ANGELES???

_____ If natural gas causes less air pollution than burning coal or oil, put U. If not, put N.

_____ If forest fires are the largest source of air pollution, put O. If not, put C.

_____ If temperature can change air pollution levels, put L. If not, put P.

_____ If automobiles and factories create air pollution, put A. If not, put E.

Name ______________________________

DIRECTIONS: Write statement or question in front of each sentence.
Use the correct punctuation at the end of each sentence.

______________ Could you live without electricity ___

______________ There would not be any electric lights ___

______________ We could use oil lamps or candles for lights ___

______________ How would we cook our food ___

______________ Long ago people used open fires or wood-burning stoves ___

______________ Don't some people still use those today ___

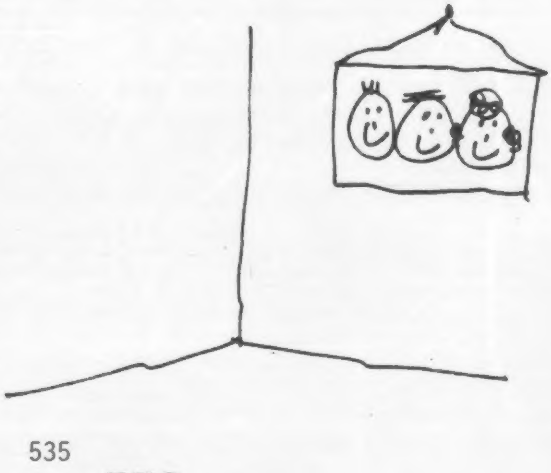
______________ What else would we have to do without ___

______________ Some water heaters operate with electricity ___

______________ How will I run my vacuum cleaner, refrigerator, hair dryer, or electric toothbrush without electricity ___

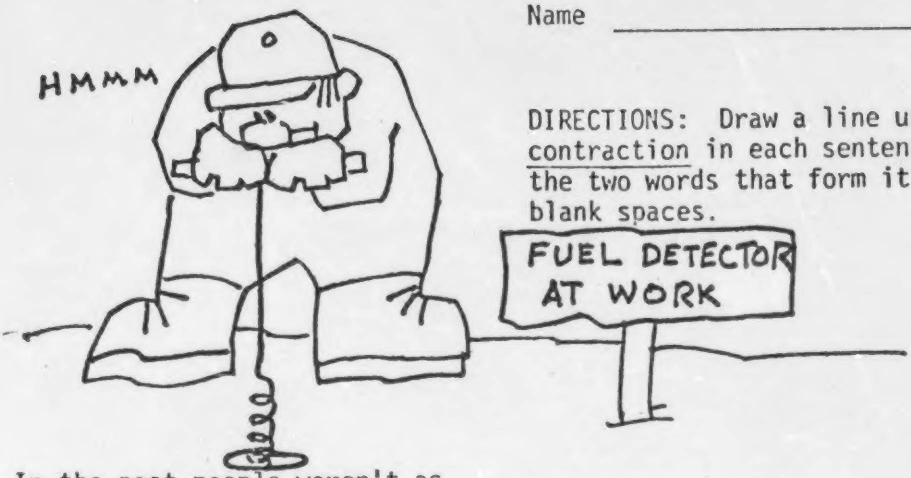
______________ Life would surely be a lot different without electricity ___

How many things can you think of that need electricity to work? Make a list.
(You'll probably need to use the back of this paper too !)



Name ________________________________

DIRECTIONS: Draw a line under the contraction in each sentence. Write the two words that form it on the blank spaces.



1. In the past people weren't as dependent on fossil fuels. ________ ________

2. Today we've become dependent on machines to do our work. ________ ________

3. If we use up our fossil fuels, we'll have to change the way we live. ________ ________

4. There's a limit to the amount of fossil fuels in the ground. ________ ________

5. It's important not to use more than you need. ________ ________

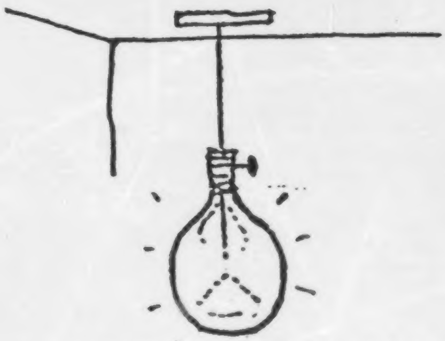
6. Cars won't run without oil to make gasoline. ________ ________

7. Some people couldn't heat their homes without coal or natural gas. ________ ________

8. Without oil, we wouldn't have anything made of plastic. ________ ________

9. What would you have to do without if you didn't have oil or natural gas? ________ ________

10. We're going to have to find alternative energy sources. ________ ________



Name ______________________________

DIRECTIONS: Draw a line under the correct verb form to complete each sentence below.

Ways of Saving Energy with Lighting

1. Turn off lights when you leave leaving a room.

2. Fluorescent lights should be use used whenever possible.

3. They give gives four times the light for the same amount of electricity.

4. Fluorescent lights will also last lasting ten times as long and produce less waste heat.

5. Dust Dusts light bulbs often.

6. Dirt and dust absorb absorbs light and waste energy.

7. Turning Turn off all outdoor lights not necessary for safety or security.

8. Lampshades with white liners will reflect reflects more light.

9. Don't leave left unnecessary lights burning when gone at night.

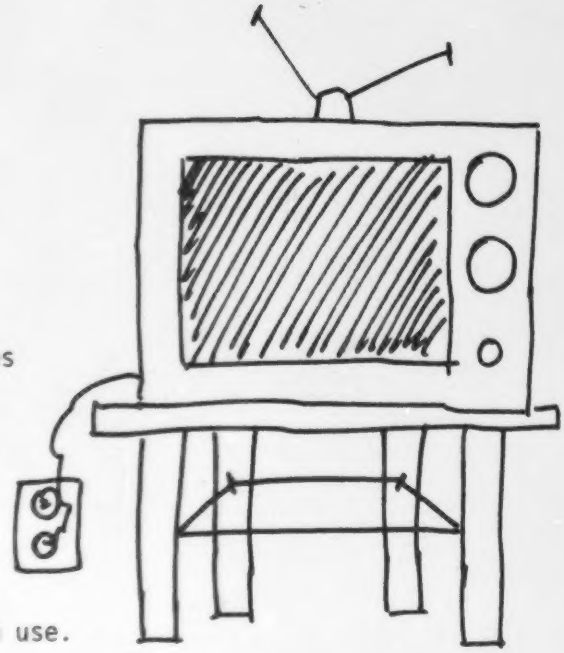
10. Use Using automatic timers which will turn different lights on for short periods of time and make the house look 'lived in'.

11. Remember, the wattage of a bulb does not measure measures the amount of light it gives, but rather the electricity needed to light it.

12. Light is measured in lumens, which can be found find on each bulb package.

Name ______________________________

DIRECTIONS: Use these words to make compound words in the sentences below.



one	ever	washer
not	ends	time

1. Only run dish ___________ , clothes washer and dryer with full loads.

2. Wash clothes in warm or cold water when _________ possible.

3. Every _________ should turn off TV sets and radios when they are not in use.

4. Self-cleaning ovens (due to high energy requirements) should be used only on week ________ when other energy requirements are low.

5. Use appliances during the morning and night __________ hours when total energy uses are lower.

6. We can _______ afford to waste energy.

Write the compound words on the blank spaces.

____________________ ____________________

____________________ ____________________

____________________ ____________________

Name ____________________________________

DIRECTIONS: Write the right homonym in each space.

1. If we (waist, waste) ________________________ our natural resources, the supply will run out.

2. Fossil fuels will (not, knot) _______________ last forever.

3. This is because (new, knew) ________________ fossil fuels are not being made as fast as we are using them.

4. People are learning how to store solar energy (sew, so) ______________ we can use it.

5. We (no, know) ________________ that geothermal energy comes from underground steam.

6. Burning coal causes a (grate, great) __________________ amount of air pollution.

7. Many people (see, sea) _______________ nuclear energy as the power source of the future.

8. (Some, Sum) _____________ companies are burning garbage to provide energy.

9. Water flowing (threw, through) ______________________ dams creates hydro power.

10. The best (way, weigh) ___________________ to save energy is to use it wisely.

Name ________________________

DIRECTIONS: Synonyms are words that have the same, or almost the same, meaning.

Use the words below to complete the sentences. Choose the word that has almost the same meaning as the word in parentheses ( ).

bothersome resistant affected survive

pesticide only applied effectively

1. Spraying poisons on pests works (well) ________________ at first.

2. Most of the (troublesome) ______________ insects will die.

3. But a few will not be bothered by the (poison) ____________________.

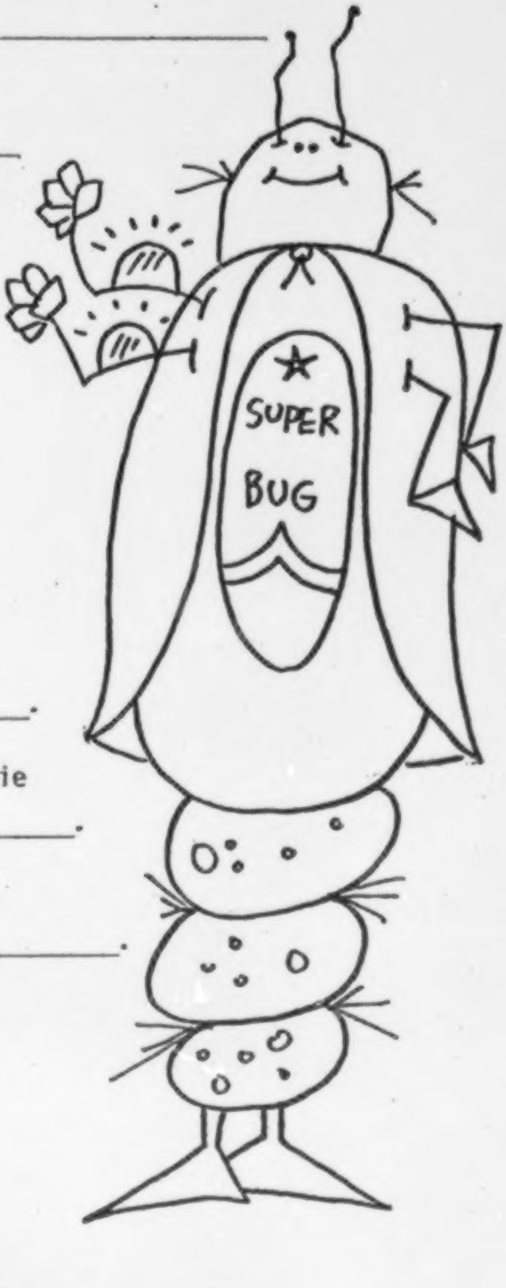
4. They will live to make more insects that are also (immune) ___________________ to the poison.

5. When these new pests are sprayed, (just) _____________ a few die.

6. Many of the insects, like their parents, are not (bothered) _____________________.

7. Every time the pests are sprayed, fewer die and more continue to (live) ________________.

8. Soon the poison does not work at all, no matter how much is (used) ____________________.



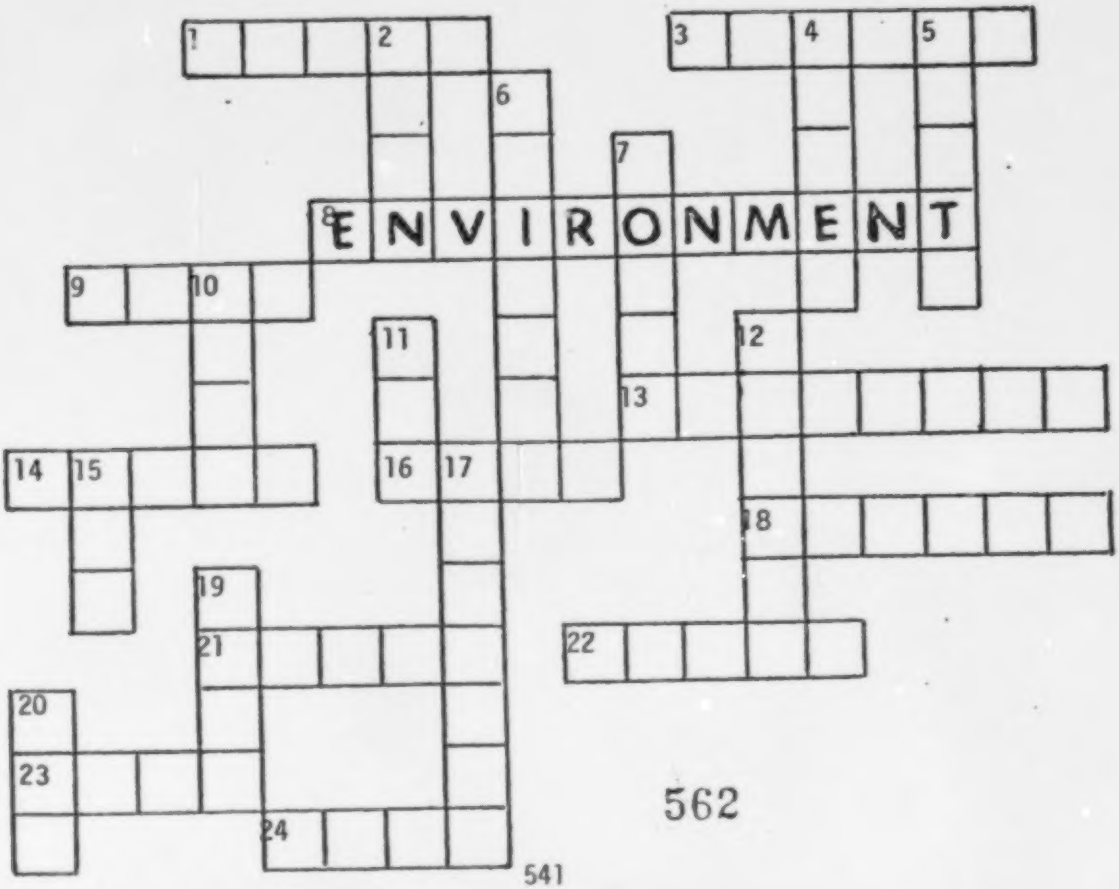
Name ______________________________

Across

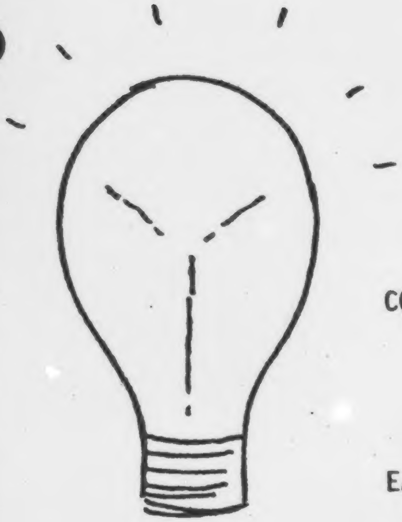
1. Every Litter Bit ______!
3. Trash where it doesn't belong, is called _____.
8. The _______ is what every living thing needs for life. (already filled in)
9. ______ are good to clean with. Save them.
13. ______ *needs to help the ENVIRONMENT!*
14. Each living thing must have ______ in its ENVIRONMENT.
16. Dirty water from factories kills many ______.
18. People, animals, and _____ live on Earth.
21,22. When you run the shower too long you _____ ______.
23. When something is not nice to look at, it is _____.
24. ______ put much poison into the air.

Down

2,11. When you leave a room, _____ ______ the lights.
4. Paper is made from _____.
5. Each living thing must have ______ in its ENVIRONMENT.
6. The ENVIRONMENTS of many ______ have been hurt by man.
7. _______ bothers people and hurts ears.
10,19. _______ ________ good, used items. Don't throw them away.
12. Too many _____ have hurt the ENVIRONMENT.
15. Each living thing must have ______ in its ENVIRONMENT.
17. Many birds eat _____.
20 The ______ provides light and heat.



Name ______________________________



These energy words are hidden in the sentences below. Find the words and draw a circle around them.

COAL SUN WIND HYDRO SEWAGE

WASTE SOLAR RESOURCE TIDAL AIR

EARTH OIL GAS HEAT WATER

1. There were two pairs of shoes under the bed.
2. Potatoes stay raw in dark places.
3. He got so large because he ate so much.
4. Mr. Jones was teaching as Miss Ewage was sick.
5. Sorry I'm late but I dallied at the disco all night.
6. Lime and lemon are sour centers in munchy drops of candy.
7. If you have two, I'll take one.
8. I like Arthur's SWAT eraser.

Name ______________________________

DIRECTIONS: Draw a line under the best word to complete each sentence. Circle those words in the 'word find' below.

1. Cubic feet are used to measure water. height.

2. Therms Kilowatts tell you how much electricity a light bulb uses.

3. Insulation materials are rated by thickness R value which measures resistance to heat flow.

4. Fluorescent light bulbs use less electricity natural gas than incandescent bulbs.

5. You should turn off on lights when you leave the room.

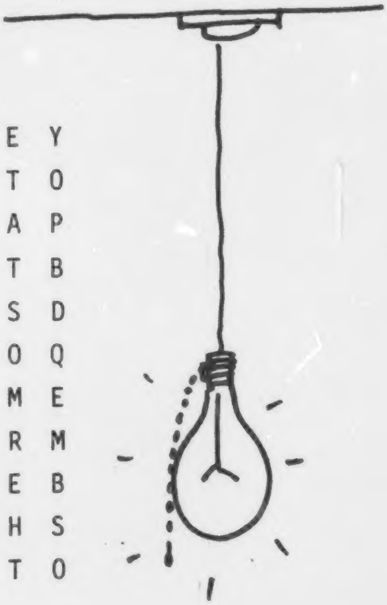
6. Closing the damper when the fireplace is not in use prevents house pets heat from escaping up the chimney.

7. Leaky faucets waste clean water.

8. Taking a long quick shower instead of a bath uses less hot water.

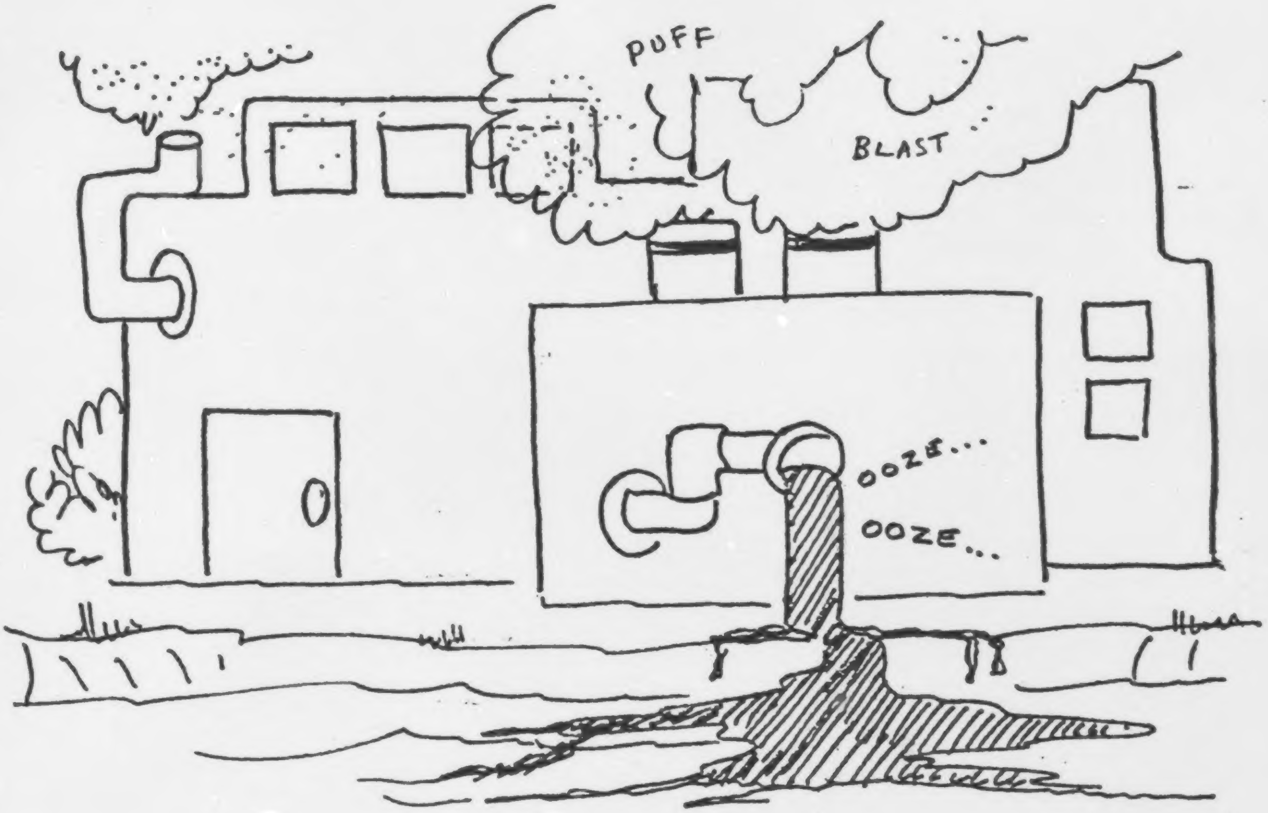
9. Turning your blanket thermostat down 10 degrees at night will save 10% in heating energy.

10. Saving energy money will help to conserve our natural resources.



B	O	S	V	T	X	A	K	E	E	Y
M	P	A	A	Q	U	I	C	K	T	O
L	E	U	F	W	S	T	C	I	A	P
M	A	R	O	H	V	E	C	L	T	B
O	W	V	P	E	T	I	X	O	S	D
X	I	A	R	A	R	P	F	W	O	Q
N	O	L	I	T	D	F	Z	A	M	E
W	K	U	C	S	E	Y	S	T	R	M
F	R	E	T	A	W	A	S	T	E	B
J	L	A	A	B	Y	O	C	S	H	S
E	N	E	R	G	Y	W	X	I	T	O

Name ______________________________


PUFF
BLAST
OOZE...
OOZE...

Write the following words in alphabetical order.

pollutant
erosion
toxic
detergent
algae
waste
stagnation
phosphates
flume
biodegradable

1. ________________________

2. ________________________

3. ________________________

4. ________________________

5. ________________________

6. ________________________

7. ________________________

8. ________________________

9. ________________________

10. ________________________

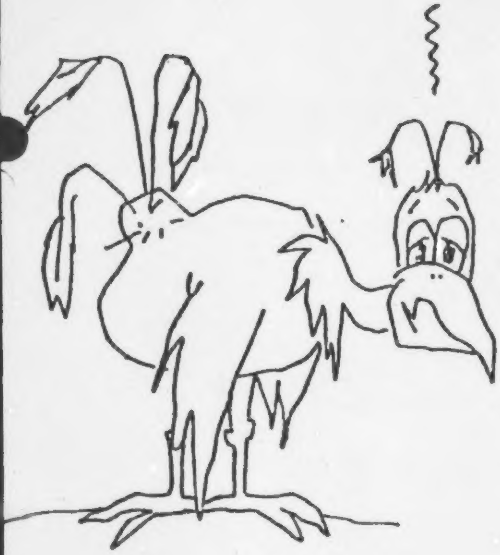
Name ______________________________

The students in Mr. Parks' class are learning about ecology. They know that when you go shopping you have the choice to buy products that will not cause pollution or waste. They have made a list of ideas to remind people how to be ecology-wise shoppers.

Help them get the list ready for printing by finding and correcting the twenty spelling errors.

Reminders for Shoping

1. Avoid buying paper plates or cups that coz uneccessary waste.
2. Buy drinks in returnible bottels.
3. Buy laundrie deturgents that are low in phosphates. Try to find one that is labled biodegradeble.
4. Don't buy products that have exter packageing. Try to choose those that come in contaners that can be used again.
5. Avoide plastic bags unles you can use them at home. Plastuc is not biodagradable.
6. Buy bathroom tissu that is white. The color dies can pollute our water.
7. Save shoping bags from the store to be used agen.



Name ______________________

This is a letter to the Audubon Society from Ima Bird. Since he did not go to school, he needs some help in using the right pronouns. Correct the letter by changing the pronouns to the proper forms.

Dear Audubon people,

I have heard that you help birds. Us birds are getting sick because the people who live near we are spraying pesticides around to kill the insects. Us eat these insects and then us get sick too.

Also, there is this factory that keeps dumping its waste into the bay. This makes the water dirty and us get sick from drinking that too.

The air pollution isn't helping we much either. Me friend, Henry Hawk, can't fly right anymore because the pollutants make the air too heavy and she can't glide through that thick air.

Lastly, the people are now filling in the marsh land where us live with more dirt so them can build more houses.

I need our help.

Hopefully,

Ima Bird

The National Audubon Society has been working to protect our environment for many years. They know a lot about birds and how they live. You can write to them and ask about birds where you live. Their address is:

National Audubon Society
950 Third Ave.
New York, New York, 10007

Name ______________________________

DIRECTIONS: On the line at the right of each sentence write the adjective that describes the underlined noun.

1. Rushing water can be used to generate electricity. ______________________

2. Geothermal energy comes from underground steam. ______________________

3. The wind, sun and water are continuous sources of energy. ______________________

4. There is a limited supply of fossil fuels. ______________________

5. Some people think there are unacceptable risks connected with nuclear energy. ______________________

6. Trapped water from rising tides can be used to create tidal energy. ______________________

7. Energy can even be produced from rotting garbage. ______________________

8. Careful thought must be given to how we use our energy sources. ______________________

Write an adjective in the blank space for each sentence.

9. Burning coal as fuel can result in ______________________ air.

10. The ______________________ sun is the source of solar energy.

11. We are looking for ______________________ ways to provide energy.

12. Wise use of our energy sources will make a ______________________ world.

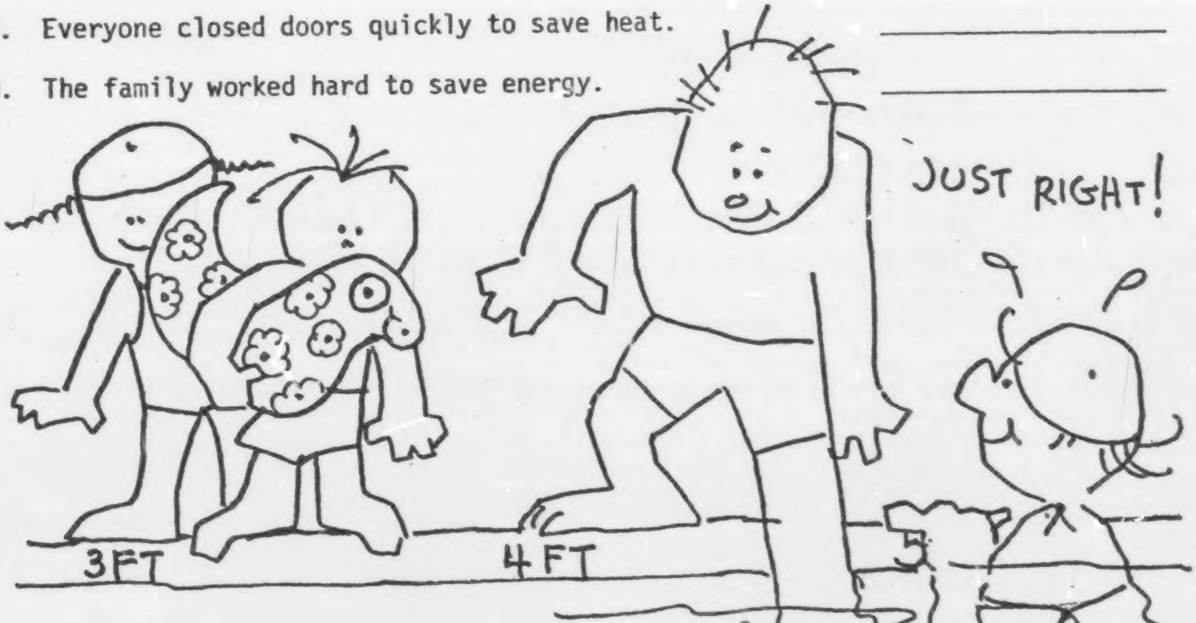
Name ______________________________

DIRECTIONS: Adverbs tell how, when, or where about a verb.

In the sentences below:
Draw one line under the verb,
Draw two lines under the adverb, and
Write HOW, WHEN, or WHERE the adverb describes the verb.

Carole's family is trying to save energy. Here are some of the things they did to conserve energy and our natural resources.

1. First, they put insulation in the attic and walls. when
2. The parents drove slowly to save gasoline. ________________
3. Carole rode her bike often. ________________
4. They wisely used solar heating for their swimming pool. ________________
5. Carole's dad carefully fixed all the leaky faucets. ________________
6. The family always took short showers. ________________
7. They turned the thermostat lower. ________________
8. Sometimes they recycled bottles and cans. ________________
9. Everyone closed doors quickly to save heat. ________________
10. The family worked hard to save energy. ________________



Name ______________________________

People are becoming concerned about pollution. They are trying to do things that will make our environment cleaner and a better place for all living things.

Here are some ways we are helping our environment. Put yes in front of the ones that will help. Put no in front of the ones that are foolish and unreal.

________ Young trees are being planted as old trees are cut down.

________ Polluted air is being trapped and put into balloons. These balloons will be sent to Mars.

________ Litter laws remind people to keep their environment clean.

________ Scientists are working to find new ways to kill insects. They are looking for ways which won't harm birds and other animals.

________ Students are planting toothpicks in the school yard. This will help to save our trees.

________ There are places where wild animals are protected. There are laws to protect other animals.

________ Engineers are working to design car motors that won't poison the air.

________ Many people are riding buses or bicycles. That means fewer cars on the streets.

________ Farmers are planning to grow tomatoes on the moon where there are no insects.

________ All families are raising polar bears in their backyards. This will help them to become less endangered.

________ More and more factories are taking the poisons from their smoke and cleaning their used water.

________ Scientists are planning to send rocketships to the sun to collect solar energy.

________ City planners are working to beautify the cities. They are also trying to save open spaces for parks.

________ Many people recycle or reuse things they buy. This helps get rid of trash and waste.

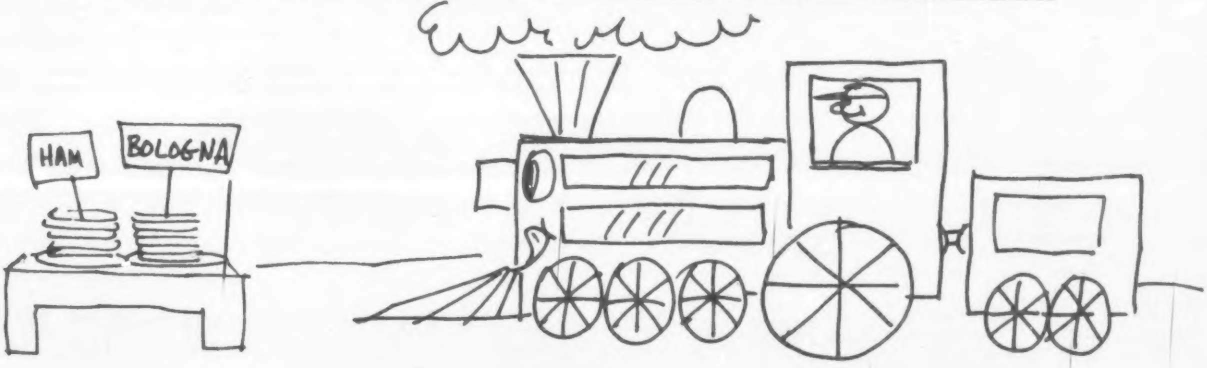
________ People are saving gasoline by driving backwards.

Name ______________________

Coal, oil and natural gas are fossil fuels. They are the three sources of energy most used in our society today.

DIRECTIONS: Do the problems. Use your answers to solve the riddle.

362 + 415 A	843 + 126 P	331 + 426 Y	806 + 121 B
463 + 431 C	271 + 608 T	540 + 319 L	162 + 332 S
728 + 170 R	341 + 456 O	846 + 120 W	128 + 441 U



WHAT DO STEAM ENGINES EAT?

____ ____ ____ ____   ____ ____ ____ ____ !

894 797 777 859   894 569 879 494

Name ______________________________

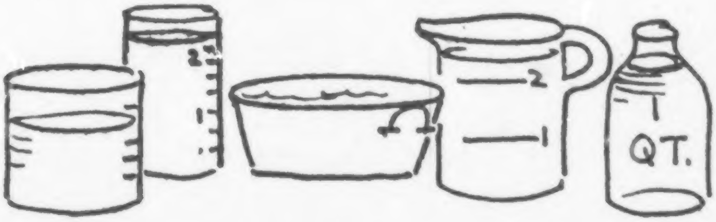
James has made a chart to show how much water is needed for different purposes. It is confusing because James used different kinds of measurements. Use the following equivalents to change all the amounts into gallons.

4 quarts = 1 gallon
8 pints = 1 gallon
16 cups = 1 gallon

USES OF WATER

It takes this much water to:

run a dishwasher (per load)	100 quarts	_____ gallons
take a shower	40 to 80 pints per minute	_____ to _____ gallons per minute
fill a bathtub	480 cups	_____ gallons
run a washing machine (per load)	320 pints	_____ gallons
flush the toilet	12 to 20 quarts	_____ to _____ gallons
grow a pound of potatoes	60 gallons	_____ gallons
make one Sunday paper	2,400 cups	_____ gallons



Name ______________________________

Jim is planning to start an organic garden. This means that he will not be using poisons to kill insects or any chemicals as fertilizers. He will only be using natural materials in his garden.

DIRECTIONS: Help him to add the costs of the things he is planning to buy. Add each list and then add the total cost.

Handyman Lumber Store

1.	Wood (for fencing)	$ 8.12
2.	Wire (for compost bin)	4.14
3.	Nails - 2 pounds	.62
4.	Sand (to loosen soil)	3.15
	Total	$

Green Thumb Nursery

1.	Six tomato plants	$ 1.20
2.	Carrot seeds	.39
3.	Onion sets	.79
4.	Lettuce plants	.90
5.	Marigolds (to get rid of slugs)	1.35
	Total	$

Variety Store

1.	String	$ .39
2.	Watering hose	7.59
3.	Garden gloves	1.98
	Total	$

Sam's Pet Store

1.	Earthworms (to loosen soil)	$ 1.17
2.	Ladybugs (to get rid of aphids)	1.09
	Total	$

Total Amount Needed

Handyman Lumber Store $ ________

Green Thumb Nursery $ ________

Variety Store $ ________

Sam's Pet Store $ ________

Total $ ________

What did the big flower say to the little flower?
HI, BUD!

Name ______________________________

The following problems are examples of people who are saving energy, natural resources, and money too.

DIRECTIONS: Read how much they saved and write the amount in standard numerals.

1. Howard put insulation in his attic. In just one month, he saved twenty-two dollars, five dimes and three pennies on his heating bill.

   How much money did Howard save? $ ____________

2. The Parks family turned their thermostat down to 65 degrees. Last month they saved three dollars, two quarters and one nickel.

   How much money did the Parks family save? ____________

3. Mrs. Smith is keeping her drapes open in the daytime to allow the sun's heat in and closing them at night to keep the cold out. So far she has saved one dollar, one quarter, two dimes and two pennies.

   How much money has Mrs. Smith saved? ____________

4. Bob fixed the leaky faucet in the kitchen. This month his water bill was one dollar, six dimes, one nickel and three pennies less.

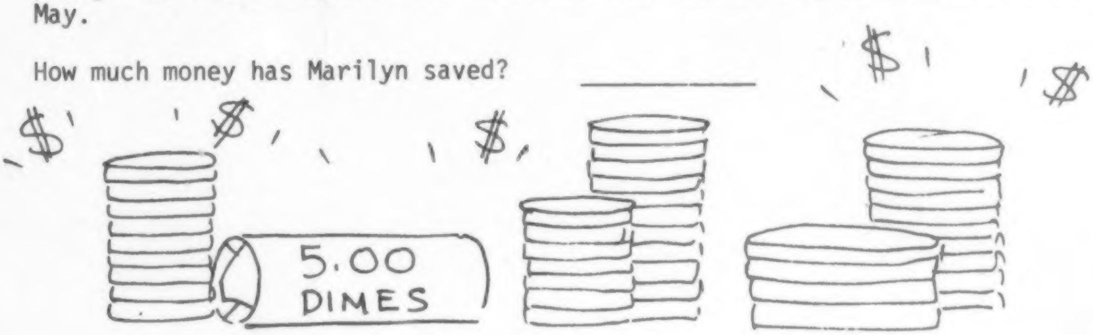
   How much has Bob saved? ____________

5. Everyone in the Jones family is saving electricity by turning out lights, watching less TV, and using fewer electrical appliances. They have saved seven dollars, one nickel and one penny in the first three months.

   How much has the Jones family saved? ____________

6. Marilyn is hanging her clothes outside on a clothesline to dry instead of using the clothes dryer. She has saved two dollars and four pennies since May.

   How much money has Marilyn saved? ____________



Name ____________________________

Read the problem. Do the work.

1. Mrs. Smith uses her washing machine 6 times a week. Last week she used a total of 192 gallons of water to do her wash. How much water does she use each time she uses her washing machine?

2. Sally has five people in her family. Each person takes a bath every night. They use a total of 150 gallons of water. How much water is used for each bath?

3. Mary has 5 people in her family, too. They each take a shower every night. They use a total of 100 gallons of water for their showers. How much water is used for each shower?

4. Mrs. Jones uses 5 gallons of water for cooking one meal. She cooks 30 meals every week. How much water does she use for cooking each week?

5. A family of four persons uses about 280 gallons of water every day. How much water is this for each person?

Which uses less water?

☐ Taking a shower.

☐ Taking a bath.

Name ______________________________

DIRECTIONS: Use the information from the table to work out the problems.

Major Electric Appliances

Appliance	Average Monthly Cost
Clothes Washer	$ .38
Clothes Dryer	3.66
Dishwasher	1.26
Freezer, frost free	6.17
Range	4.12
Refrigerator	6.30
Television, black & white	.65
Television, color	1.85

1. How much does it cost to operate a frost free freezer for 3 months?

2. How much does it cost to operate a refrigerator for 6 months?

3. How much does it cost to operate the dishwasher for 9 months?

4. How much does it cost to use a black and white television set for one year?

5. How much does it cost to use a color television set for one year?

6. How much does it cost to use a clothes washer and dryer for one year?

Name ______________________________

Mary is planning a garden for her backyard. She is going to grow her own vegetables. She is planning to buy starter plants from the nursery. Help her figure out how many plants to buy.

The garden will be 10 feet wide and 10 feet long.

She is going to plant one row of each vegetable.

1. The small corn seedlings need to be planted 6 inches apart. How many corn plants should she buy to fill one row?

2. The artichoke plants need 3 feet for each plant. How many artichoke plants should she buy?

3. The tomatoes need to be planted 12 inches apart. How many tomatoe plants will fit in one row?

4. Radishes are planted 4 inches apart. How many radish plants will be in one row?

5. She also wants a row of green onions. They need to be spaced 3 inches apart. How many onion plants should she buy?

6. String beans need more room. They should be placed 24 inches apart. How many bean plants can she buy?

7. Parsley is planted 10 inches apart. How many parsley plants will fit in one row?

8. Is there any room left in the garden? If so, how much space is left?

Name ______________________________

DIRECTIONS: One cubic foot of water is equal to about 7.5 gallons.

Multiply by 7.5 to find how many gallons of water are contained in the following:

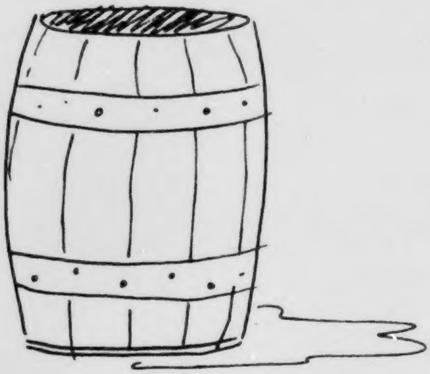
Water Heater

4 cubic feet

LITTLE
DANDY
HEATER

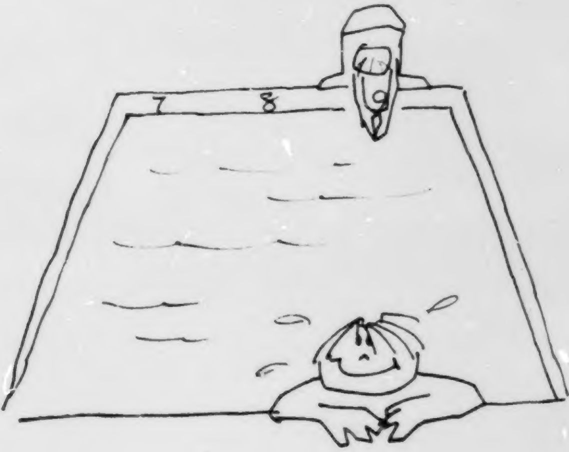
Rain Barrel

2 cubic feet



Swimming Pool

334 cubic feet



Lake

18,342 cubic feet

Name ________________________________

DIRECTIONS: Read the problems. Multiply to change the cubic foot measurements to gallons.

Water is usually measured by cubic feet.

One cubic foot is equal to 7.5 gallons.

1. A dishwasher uses three cubic feet of water. How many gallons is that?

$$\begin{array}{r} 7.5 \\ \times \quad 3 \\ \hline \end{array}$$

2. A washing machine can use five cubic feet of water for each clothes load. How many gallons is that?

3. If it takes one cubic foot of water each time you flush the toilet, how many gallons are you using?

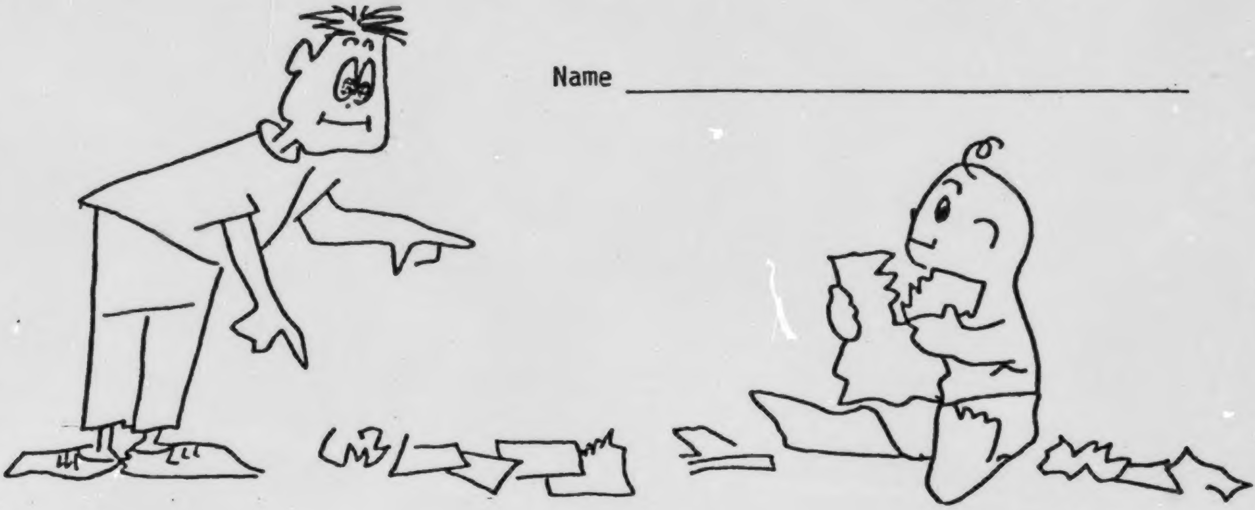
4. Mr. Smith uses eight cubic feet of water every day for his garden. How many gallons is he using each day?

5. A tub bath can use up to four cubic feet of water. How many gallons is that?

6. A shower uses about one cubic foot of water per minute. If you stay in the shower for six minutes, how many gallons of water are you using?

* People say that taking a shower uses less water than taking a tub bath. How can that be?

Name ______________________________



___ ___ ___ ___ ___ ___ ___

$1\frac{1}{3}$ $\frac{9}{10}$ $1\frac{1}{5}$ $1\frac{2}{7}$ 1 $1\frac{1}{2}$ $1\frac{2}{7}$

___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___!

$\frac{1}{2}$ $\frac{1}{3}$ 2 2 $1\frac{1}{2}$ 1 $1\frac{3}{4}$ $\frac{9}{10}$ $1\frac{3}{8}$ $\frac{7}{8}$ 2 $1\frac{1}{2}$ 1

Add these fractions to find out what the boy said to his baby brother.

$\frac{3}{4} + \frac{3}{4}$ E	$\frac{2}{8} + \frac{5}{8}$ S	$\frac{2}{3} + \frac{2}{3}$ Y	$\frac{4}{5} + \frac{2}{5}$ U
$\frac{1}{6} + \frac{1}{6}$ I	$\frac{4}{6} + \frac{2}{6}$ R	$\frac{1}{12} + \frac{5}{12}$ L	$\frac{6}{7} + \frac{3}{7}$ A
$\frac{5}{8} + \frac{6}{8}$ N	$\frac{7}{8} + \frac{7}{8}$ M	$\frac{2}{2} + \frac{2}{2}$ T	$\frac{6}{10} + \frac{3}{10}$ O

Name ______________________________

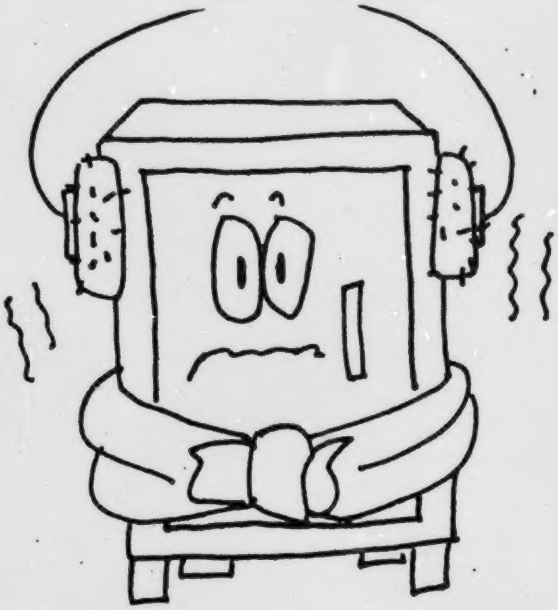
Saving Electricity Makes Cents . . . .

This is an energy chart from the PG & E (Pacific Gas and Electric Company) which shows how many kilowatts (kwh) it takes to use these electric appliances.

Using the 1/1/78 rate of 4.8¢ per kwh, figure our how much it costs to operate these appliances. Put a check mark in front of the ones you use in your home.

Appliance	Estimated Use	Energy Cost
Coffee Maker	¼ kwh per pot	_______ per pot
Deep fryer	1 kwh per hour	_______ per hour
Frying pan	½ kwh per hour	_______ per hour
Micro wave oven, 5 minutes	1/10 kwh per use	_______ per use
Oven, self cleaning	6 kwh per clean	_______ per clean
Range	1 kwh per meal	_______ per meal
Refrigerator, frostless	5 kwh per day	_______ per day
Refrigerator, manual	2 kwh per day	_______ per day
Toaster (2 slice)	1/20 kwh per use	_______ per use
Waffle Iron (3 to 4 servings)	1/3 kwh per use	_______ per use
Clothes dryer	3 kwh per load	_______ per load
Washing machine	6 kwh per load	_______ per load
Steam iron	1/3 kwh per hour	_______ per hour
Water heater	13 kwh per day	_______ per day
Waterbed heater	4 kwh per night	_______ per night

Name ______________________



Today many people have food freezers in their homes. They are used to store foods at a low temperature to prevent them from spoiling.

There are two types of food freezers. One is called 'frostless' or 'frost-free' which means that it automatically defrosts (removes the frost and ice). The other is called a manual defrost which means you need to turn it off and remove the frost and ice by hand.

Use the chart below to find out how much it costs for electricity to operate both kinds of freezers.

One kilowatt (kwh) costs $ .05.

A frostless freezer (15 cu. ft.) uses 5 kwh per day.

A manual defrost freezer (15 cu. ft.) uses 3 kwh per day.

How much does it cost to operate a frostless freezer for:

One day = __________

One month (30 days) = __________

One year (365 days) = __________

How much does it cost to operate a manual defrost freezer for :

One day = __________

One month (30 days) = __________

One year (365 days) = __________

Which one costs less to operate? ______________________

How much less:

Per day __________

Per month __________

Per year __________

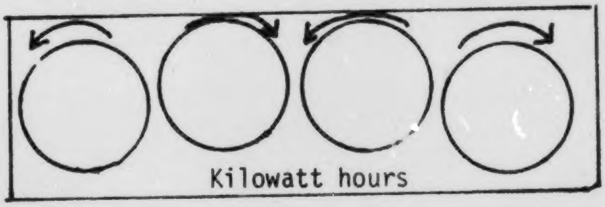
HOW TO READ AN ELECTRIC METER

Electric usage is recorded on an electric meter which is an extremely accurate instrument.

Usage is registered in kilowatt hours (Kwh).

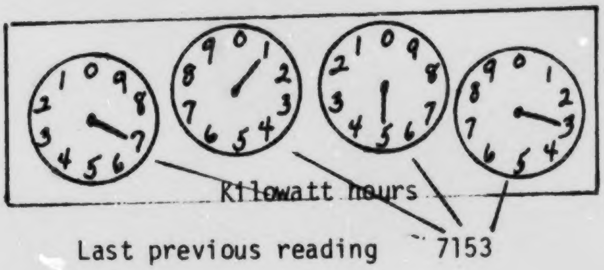
The meter has a series of four "clockhands" called dials which record the number of kilowatt hours passing through the meter.

Notice that the dials do not turn in the same direction. If the pointer is past the number, always read the smaller number.



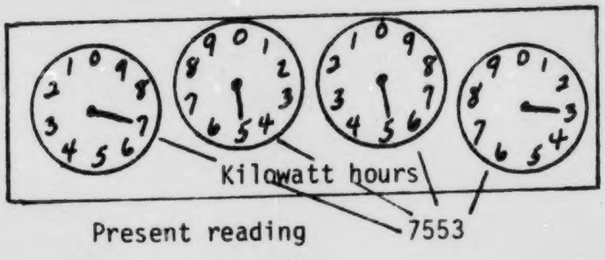
Meters usually are read once a month. To read a meter, the dials are read from left to right. When the pointer is between two numbers, write down the smaller number. When the pointer is directly on a number such as "8", read it as 8 if the pointer of the next dial on the right has passed zero, but as a 7 if the pointer of the next dial has not reached the zero point.

Example: The last previous reading of this dial is 7153 and the present reading on the dial below is 7553. Subtracting the previous reading from the present reading gives you the amount of electricity used in the billing period which is 400 Kwh.



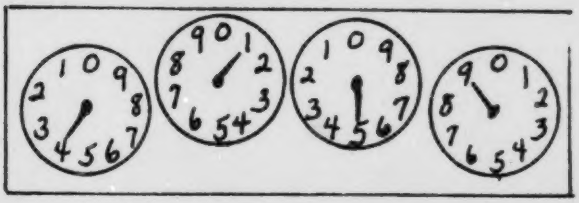
7553 Present reading
- 7153 Previous reading

400 Kwh

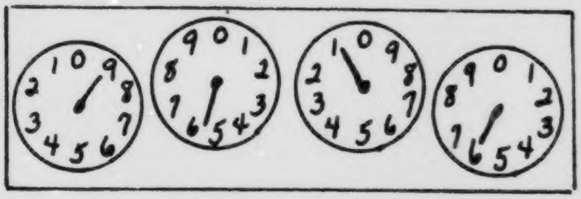


Name ______________________

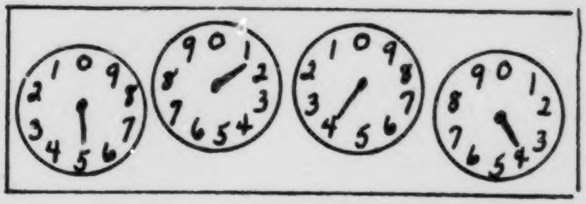
"Read" the following meters. Be sure to write your answers as kilowatt hours (Kwh).



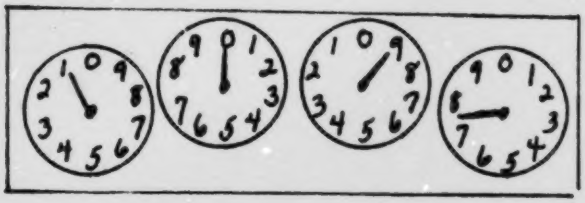
______



______



______



______

Name ______________________________

Materials that decompose or break up quickly are called biodegradable. These materials decay rapidly and become part of the soil.

Materials that are not biodegradable are bad for our environment because they cause long lasting piles of trash. It takes thousands of years for some of these materials to decompose.

Follow the directions for each column to find the name of a material that is not biodegradable.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
3	2	27	1	46	2	4	3	2	14	32	6	15	3	31	3	10	32	12	2	11	1	13	6	10	3
2	5	25	38	18	14	1	9	5	30	28	2	16	8	18	11	15	19	24	12	3	7	50	13	12	80
8	10	10	29	6	30	80	7	11	22	21	5	4	4	25	5	4	8	10	4	1	8	10	4	15	42
4	7	40	3	29	3	50	5	8	5	26	8	8	9	5	9	5	1	1	18	9	3	20	3	19	6
6	8	38	25	3	10	3	3	13	6	27	4	11	2	2	1	20	10	20	6	6	6	25	8	4	1
10	6	11	16	24	5	10	1	7	11	22	9	12	6	15	7	1	4	3	8	5	5	5	40	18	99

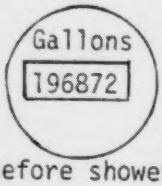
In column A blacken in all the squares containing even numbers.
In column B blacken in all the squares containing odd numbers.
In column C blacken in all the squares containing numbers evenly divisible by five.
In column D blacken in all the squares containing numbers more than forty.
In column E blacken in all the squares containing numbers less than thirty.
In column F blacken in the square that is equal to Roman numeral V.
In column G blacken in the square that is equal to Roman numeral X.
In column H blacken in all the squares with numbers evenly divisible by two.
In column I blacken in all squares with numbers between four and fourteen.
In column J blacken in all the squares with numbers evenly divisible by three.
In column K blacken in all the squares with numbers between twenty and thirty.
In column L blacken in all the squares with numbers more than ten.
In column M blacken in all the squares with numbers evenly divisible by four.
In column N blacken in all the squares with numbers above five.
In column O blacken in all the squares with numbers less than twenty.
In column P blacken in all the squares with even numbers.
In column Q blacken in the square with the number that is equal to 3 X 5.
In column R blacken in all the squares with numbers under the Roman numeral XX.
In column S blacken in the square with the number that is equal to 4 X 6.
In column T blacken in all the squares with odd numbers.
In column U blacken in all the squares containing one digit numbers.
In column V blacken in all the squares containing two digit numbers.
In column W blacken in all the squares with numbers evenly divisible by five.
In column X blacken in all the squares with numbers over eleven.
In column Y blacken in all the squares with numbers evenly divisible by six.
In column Z give your pencil a rest and do not blacken in any numbers.

Name ________________________________

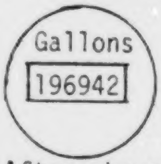
Most water meters record gallons just as a car's odometer records mileage. However, some water meters show the usage in cubic feet. For these, you must multiply by 7.5 (the approximate number of gallons in one cubic foot) to find how many gallons are used.

DIRECTIONS: Use the meter readings below to find out how much water is being used. Be sure to label your answers as gallons or cubic feet.

1. How much water is used in taking a shower?


Gallons
196872

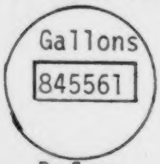
Before shower


Gallons
196942

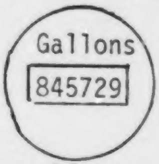
After shower

```
  196942
- 196872
---------
          gallons
```

2. How many gallons were used to wash the car?

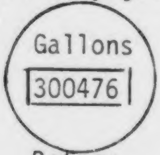

Gallons
845561

Before

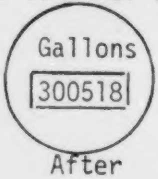

Gallons
845729

After

3. How many gallons are used for one load of wash in the washing machine?

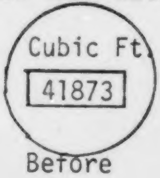

Gallons
300476

Before

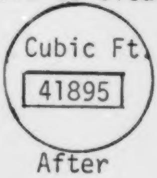

Gallons
300518

After

4. How much water was used to clean the sidewalk with the hose?


Cubic Ft.
41873

Before

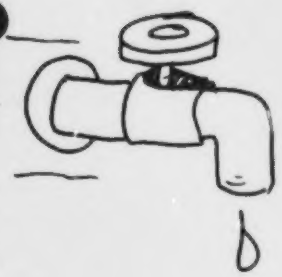

Cubic Ft.
41895

After

How many gallons of water is that? (Remember to multiply by 7.5)

Tips to save water

1. Take shorter showers.
2. When washing the car, use a bucket for soapy water and use the hose to rinse only.
3. Be sure to wash full loads when using the washing machine.
4. Use a rake or broom to clean the sidewalk, not the hose.



Name ______________________________

Leaky faucets can waste a lot of water. To find out if you have a leak, turn everything off carefully so that no water is being used anywhere in the house. Then check the position of the water meter dial for about fifteen minutes. If it hasn't moved, you know that your house is leak free. But if it has, start checking to find that leak.

DIRECTIONS: Find out how much water can be wasted by changing pints to quarts and quarts to gallons.

Remember: 2 pints = 1 quart 4 quarts = 1 gallon

A slow leaking faucet can waste up to 5 pints of water in one hour.

1. How many pints of water are wasted in four hours?

2. How many quarts are wasted in eight hours? How many gallons is that?

3. How many gallons of water are wasted in 24 hours (one day)?

4. How many gallons of water are wasted in one month (30 days)?

Name ______________________________

DIRECTIONS: Answer the questions by changing the Roman numerals to standard numbers.

I = 1
V = 5
X = 10
L = 50
C = 100
D = 500
M = 1000

1. In 1970 each American used an average of DLIII pounds of paper.
   How many pounds of paper did each American use? ______________________________

2. Each person also used approximately CXCVIII board feet of lumber.
   How many board feet of lumber did each person use? ______________________________

3. Americans spent more than XXXIX billion dollars for wood products.
   How much money was spent on wood products? ______________________________

4. There are more than 10,000 sawmills and CCC pulp mills in the United States.
   How many pulp mills are there in our Country? ______________________________

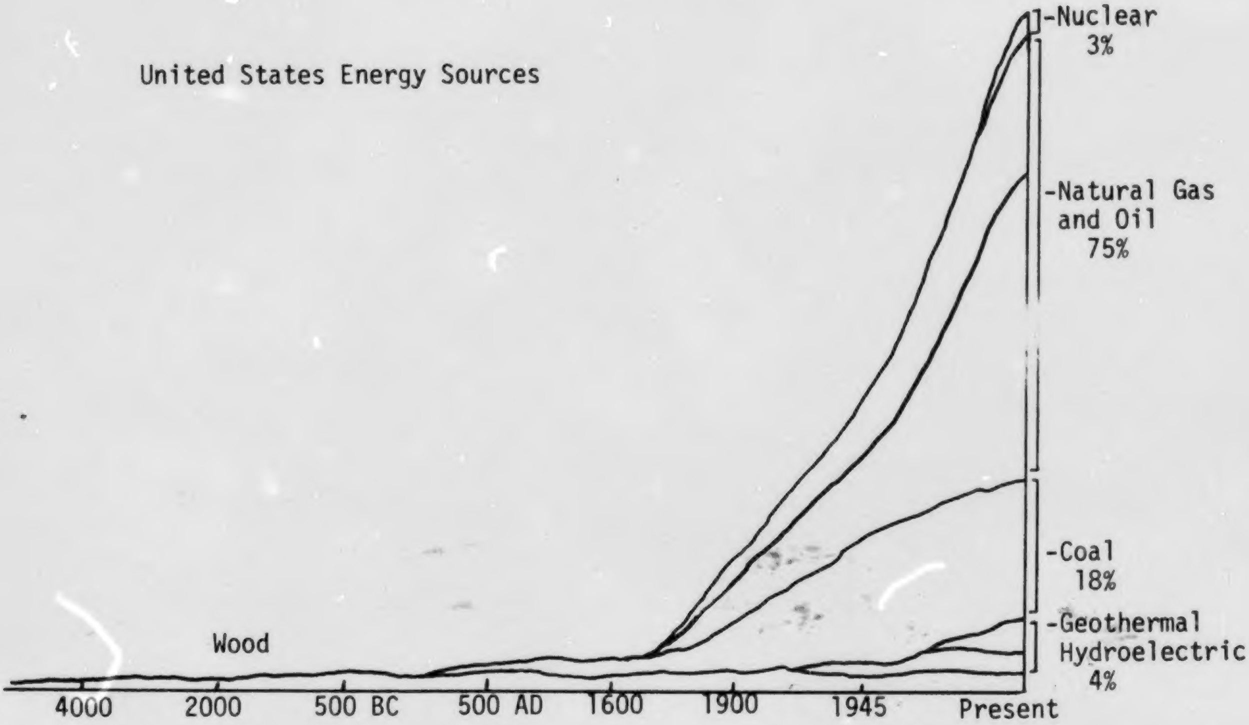
5. There are also more than DCCC paper mills in the United States.
   How many paper mills are there? ______________________________

6. Paper board mills can roll out newsprint at XX miles an hour.
   How fast can the paper board mills make newsprint? ______________________________

7. The average Sunday newspaper has about CXXVIII pages.
   How many pages does the average Sunday newspaper have? ______________________________

8. The Sunday newspaper requires over CXL acres of pulp wood for the circulation of one edition.
   How many acres of pulp wood is needed to make the Sunday newspaper?
   ____

Name ______________________________


United States Energy Sources

DIRECTIONS: Use the graph to answer the questions.

1. What energy source has been used for the longest period of time?

____

2. When the first settlers arrived in America in 1620, what sources of energy did they have?

____

3. At the present time, what are our largest sources of energy?

____

4. Which source of energy has most recently been developed?

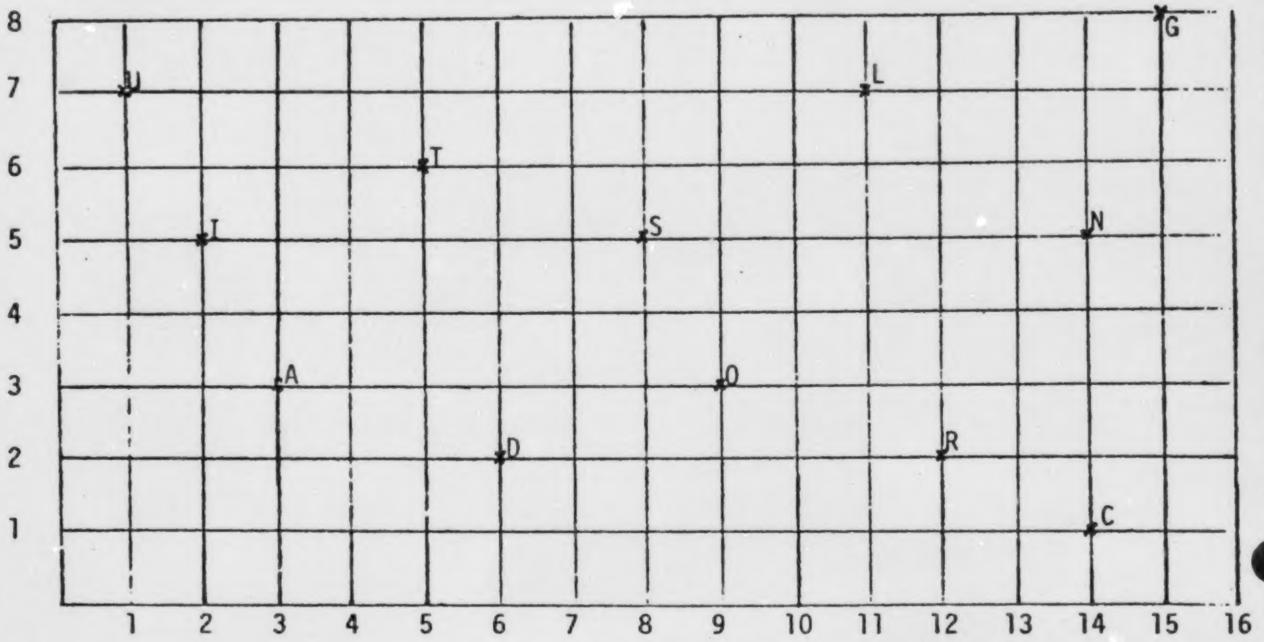
____

5. What percentage of our energy comes from geothermal and hydroelectric sources?

____

Name ____________________

Fuel is matter that is burned to get energy.



Count over and up, carefully follow the rules.......
and you'll write down the names of the three fossil fuels.

over →	up ↑	
9	3	O
2	5	
11	7	

over →	up ↑	
3	3	
14	5	
6	2	

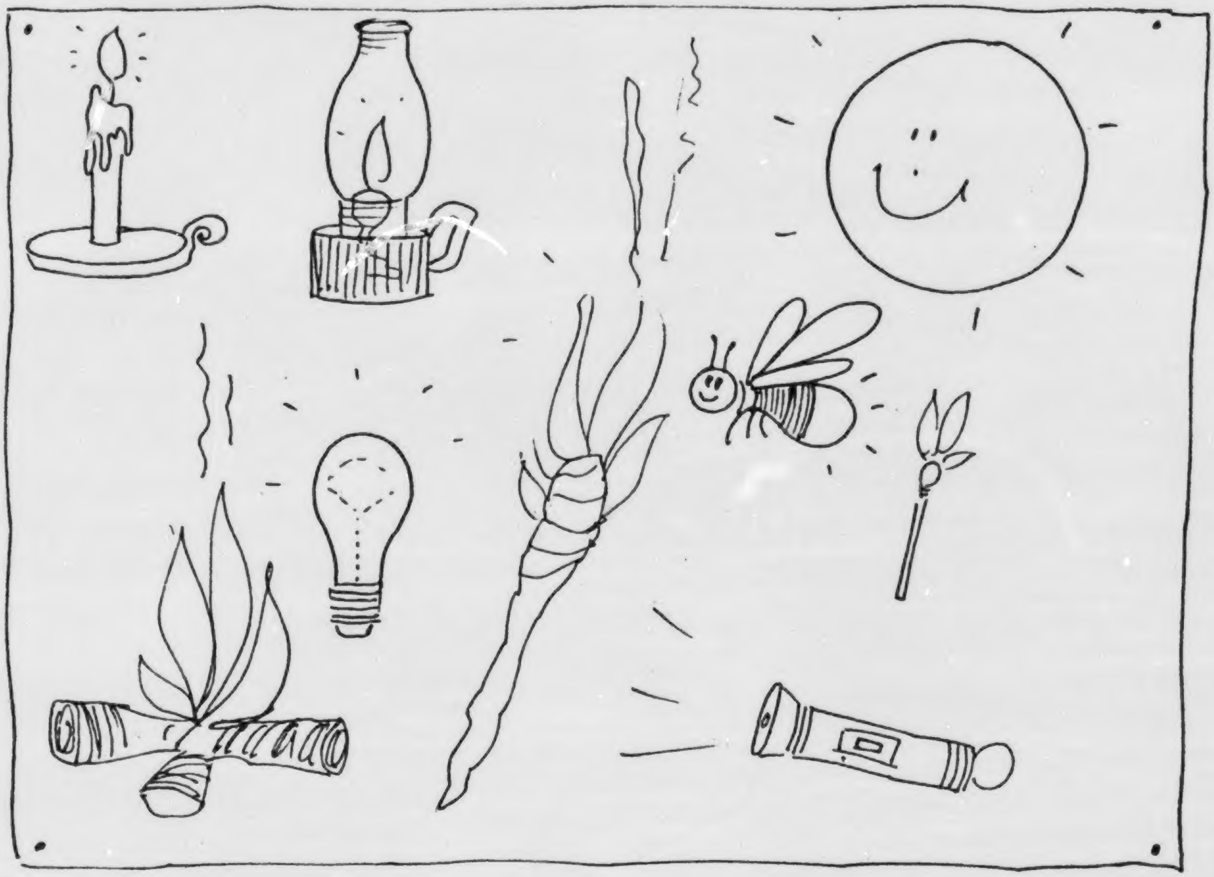
over →	up ↑	
14	5	
3	3	
5	6	
1	7	
12	2	
3	3	
11	7	

over →	up ↑	
15	8	
3	3	
8	5	

14	1	
9	3	
3	3	
11	7	

Name ______________________________

DIRECTIONS: Use the pictures to answer the questions.



1. Which things were used for light by the earliest people?

____

2. Which things do you use for light?

____

3. Which thing will last the longest?

____

4. Which source of light is a living thing?

____

5. Which thing needs electricity to produce light?

____

Name ______________________________

People have used the earth's natural resources to provide energy for a long time.

I'VE BEEN AROUND!

DIRECTIONS: Put an X in the boxes to show when people used, use, or may use the following resources for energy.

RESOURCE	More than 200 years ago	Now	Future
Wood			
Hydro (water)			
Wind			
Geothermal			
Solar (sun)			
Nuclear			
Tidal			
Oil			
Coal			
Natural gas			

Three of these energy sources, the sun, wind, and water cannot be used up. Some others, like wood, are renewable. By using wood carefully and replanting trees, we can continue the supply. The fossil fuels, coal, oil, and natural gas are in limited supply and we are in danger of running out of these widely used energy sources. Why are the fossil fuels not renewable?

Name ______________________________

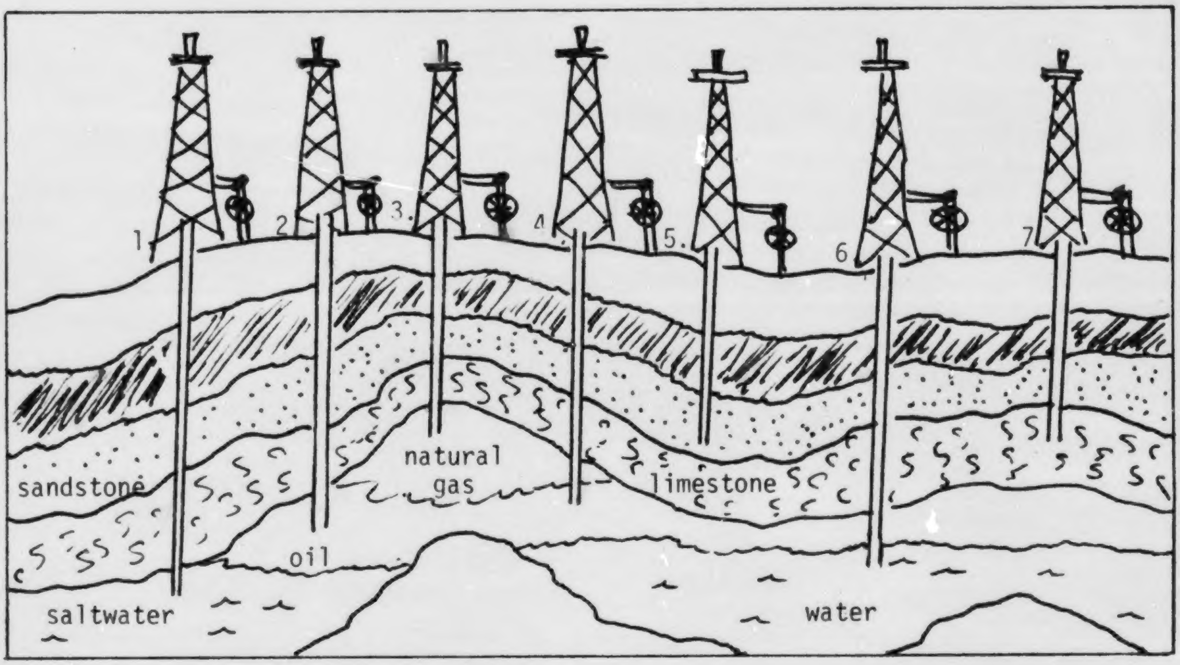
Fossil Fuels

Fossil fuels began forming in the earth many millions of years ago. This was a time when the earth was covered by many warm, shallow oceans and dinosaurs and other prehistoric plants and animals lived. As these plants and animals died, they sank to the ocean floors and decayed into sludge. These layers of sludge were quickly covered by mud. As the weight of the water and mud pressed down on the sludge, it began to change into the fossil fuels which we call coal, oil and natural gas.

This whole process took millions of years. During this period of time, the surface of the earth was constantly changing, creating mountains, deep oceans and other land forms. The mud layers became different types of rock, and pools were formed which trapped the oil and natural gas.

Today, some fossil fuel deposits are found near the earth's surface while others are buried deep under the ground. Scientists are constantly looking for new places to drill for oil and natural gas. It often costs millions of dollars to drill for oil and there is only one chance in nine that oil will be found.

DIRECTIONS: Look at the diagram below. Tell what you would expect to find from drilling each well.



Well No. 1 ______________ No. 2 ______________ No. 3 ______________

No. 4 ______________ No. 5 ______________ No. 6 ______________

No. 7 ______________

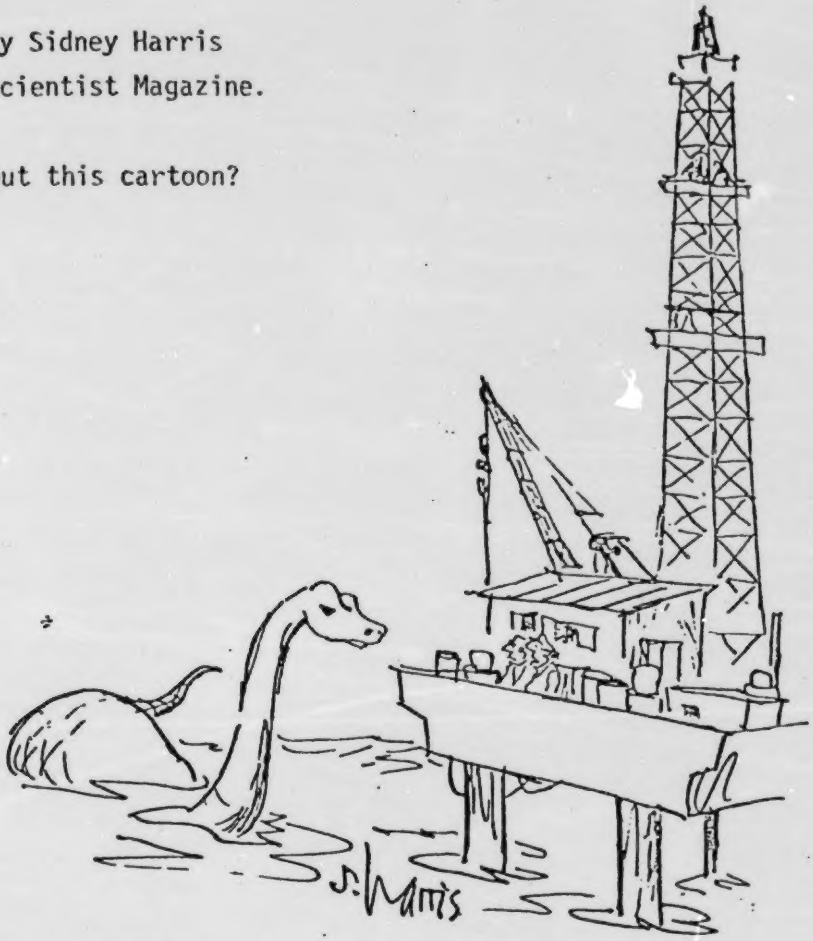
Why don't we drill wells to find coal?

Name ______________________________

Cartoons are often used to present every day problems in a funny way. They can help us to smile and laugh at ourselves and our problems.

Here is a cartoon by Sidney Harris
from the American Scientist Magazine.

What's so funny about this cartoon?



"I have a feeling it's too soon for fossil fuels around here."

DIRECTIONS: Use the back of this paper to draw your own cartoon about the energy problem. Use one of these captions or make up your own.

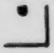
"Well, at least we won't have any more oil spills."

"I said save fossil fuels, not fossil fools."

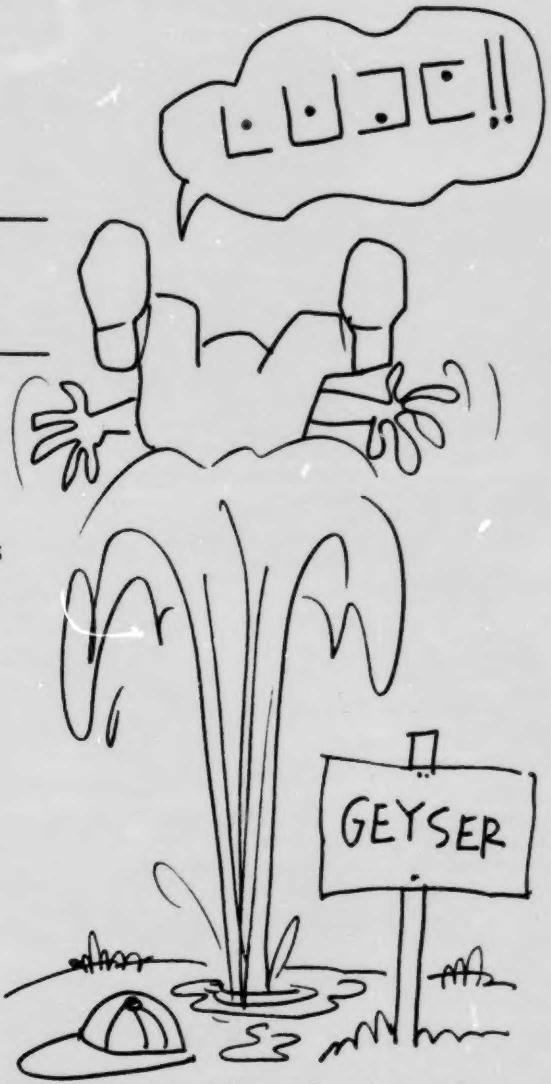
"Boy, Harry is really ready for the oil shortage."

Name ______________________________

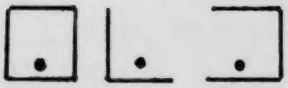
DIRECTIONS: Use this code to answer the questions. Look at the shapes and positions of the letters.

For example: A= 

A B C	D E F	G H I
J K L	M N O	P Q R
S T U	V W X	Y Z

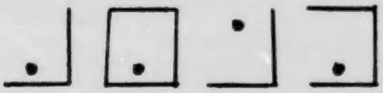


The fossil fuel used to make gasoline is



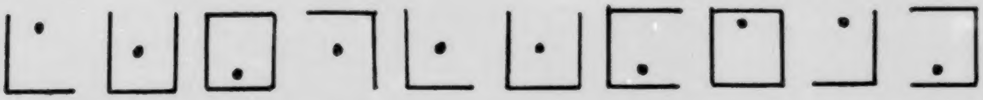
___ ___ ___

The fossil fuel we have the most of is



___ ___ ___ ___

Energy that is created by underground steam and heat, like volcanoes and geysers, is called



___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Name ______________________________

Other Uses of Oil

Oil is more than an energy source. Petroleum provides many things besides gas and oil to run our cars and heat our homes. Petroleum is a mixture of many chemicals that can be used to make useful products.

Here are just a few of the other "petro" products.

Farm Products

fertilizers
rust preventers
pesticides
weed killers

Household Products

plastic wrap
plastic dishes
styrofoam
pipes and hoses

Other Products

glasses
records
medicines
nylon and other man made materials

We have only used petroleum products during the last 100 years or so. What did people use before oil was discovered?

DIRECTIONS: Write what people might have used or done before oil was discovered to replace the things or products listed below.

Products We Use Now	What People Used Before Oil
1. Plastic sandwich bags	1. ______________________
2. Weed killers	2. ______________________
3. Plastic dishes	3. ______________________
4. Nylon and polyester fabrics	4. ______________________
5. Phonograph records	5. ______________________
6. Plastic pipes	6. ______________________
7. Fertilizers	7. ______________________

Name ____________________

Energy from the Ocean

Many people are trying to use the power of the oceans to provide energy. Scientists are exploring ways to use ocean tides, waves, and even water temperature differences to create electricity.

So far, there are three main ways of getting energy from the ocean waters.

Tidal Energy - Low dams are built to trap the ocean waters as the tides rise. When the tide rises, the water is trapped behind the dam. As the tide recedes, the water flows through the dam turning turbines to make electricity.

Ocean Thermal Energy - This energy is created by using the different temperatures of the ocean waters. Solar energy warms the surface water of the oceans. The difference in temperature between the surface water and the deeper water is a source of heat energy. It can be used to run a steam engine.

Wave Energy - The power of the ocean waves create this type of energy. Power stations are built in the ocean near shorelines. As the wave approaches the power station, the water is caused to spiral into a central pipe or core. The swirling water then turns a turbine which makes electricity.

DIRECTIONS: Write the correct name for each type of ocean energy.

____________________ Harnesses the power of the ocean waves.

____________________ Relies on changes in the ocean tides.

____________________ Uses temperature differences in ocean waters.

- -

Try this ...

To make a "wave machine" -

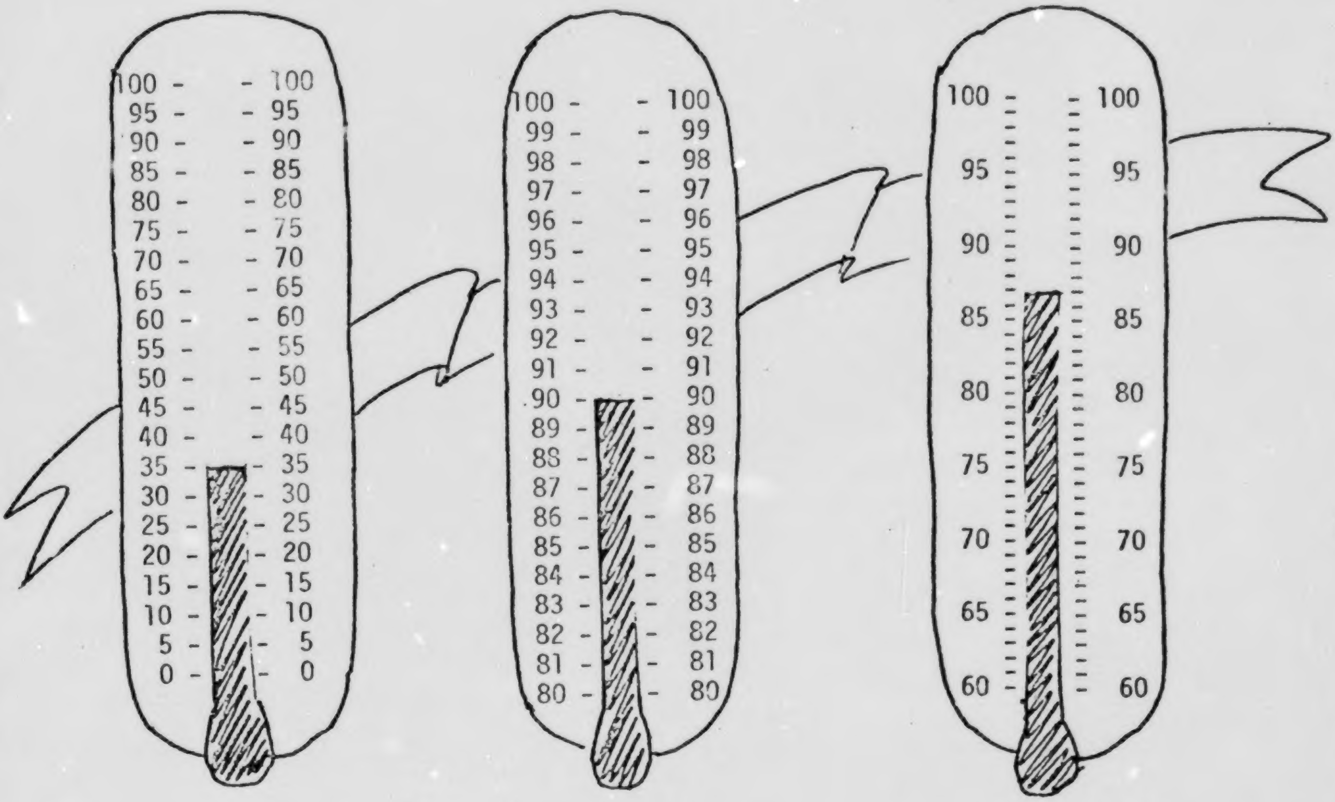
Use a tall jar. Fill it half way with water, then add mineral oil or cooking oil to the top of the jar. Add some blue food coloring or blueing. Cover the jar and presto - your very own wave machine!

Name ______________________________

We get heat and light from the sun. Many people think that this natural resource can provide much of our energy in the future. It is called solar energy.

We measure the heat that comes to the earth with a thermometer.

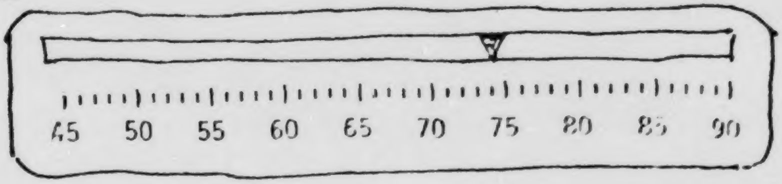
DIRECTIONS: Write the temperatures according to each thermometer below.


100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0
100 99 98 97 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82 81 80
100 95 90 85 80 75 70 65 60

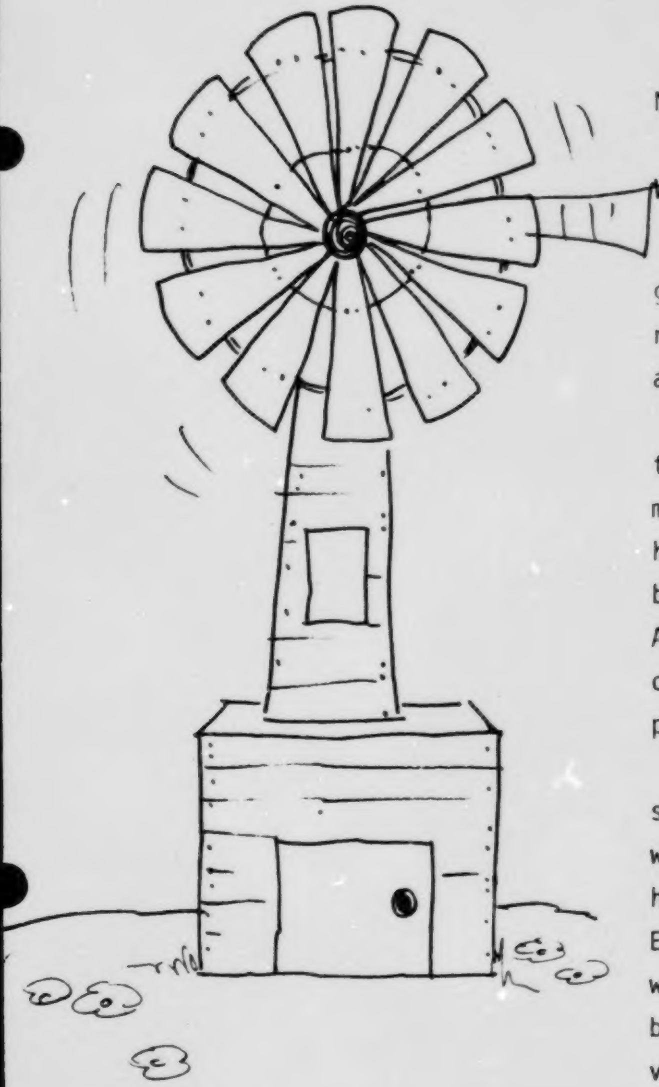
_______ degrees

_______ degrees

_______ degrees


45 50 55 60 65 70 75 80 85 90

_______ degrees



Name ________________________________

Wind Power

Many people believe that the wind is a good source of power to meet our energy needs. The wind is free, cannot be used up, and does not add pollution to our environment.

For many years, windmills have been used to harness the power of the wind. Today, many windmills are providing electricity for houses, restaurants, TV stations, and other businesses. At Downey Amusement Park near Allentown, Pa., the largest windmill in the country supplies all the electricity for the park's roller coaster.

Although the wind can be an effective source of energy, it is limited to areas where the wind blows at least ten miles per hour on the average. People who live on the East or West coasts usually have this much wind. Windmills are expensive to build but they can provide free electricity with very little maintenance.

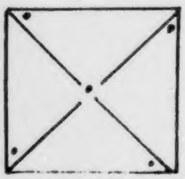
DIRECTIONS: Write the three reasons why the wind is a good source of energy.

1. ____
2. ____
3. ____

- -

Try this . . . Use this paper to make your own portable windmill.

1. Cut this paper on the dotted line.
2. Fold the square into four triangles.
3. Cut on fold lines to ½ inch from center.
4. Stick a pin through every other corner, through center, and secure to pencil eraser. Blow.



Name ____________________

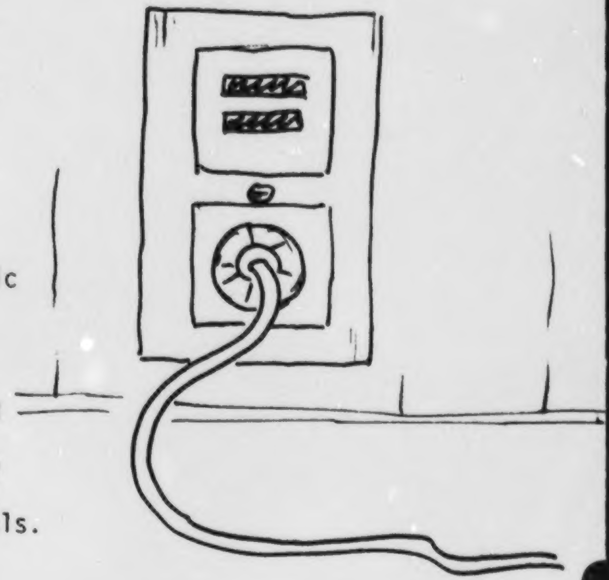
ELECTRICITY

We use electricity everyday for light, heat, and power. Where does this electricity come from?

Electricity is made by man by moving large magnets around each other. These huge magnets are parts of machines we call generators or turbines. But, electricity is not a natural resource. It takes some kind of energy to start the generators or turbines moving.

If this energy comes from water power, such as waterfalls or water stored behind dams, we call the electricity that is made hydroelectric power.

Some generators are moved by steam power. Water is heated by burning fossil fuels - oil or coal - or in nuclear power plants by splitting uranium atoms to produce heat. The steam rushes through pipes and turns the generators to produce the electricity. About 90% of the electricity generated today is produced by burning fossil fuels.



DIRECTIONS: Write the names of four natural resources which can be used to generate electricity.

____________________ ____________________

____________________ ____________________

Try this . . .

Make a chart to show how much electricity you use in one day. Use these headings.

USE	PURPOSE
(Example: Electric can opener	Open dog food can)

After one day, see how many of these uses you could do without and still have a comfortable life.

Name ______________________________

How Electricity Affects Our Lives

People began using electricity less than 100 years ago. Thomas Edison made the first practical electric light bulb in 1879. The electric motor was little used until the 1880s.

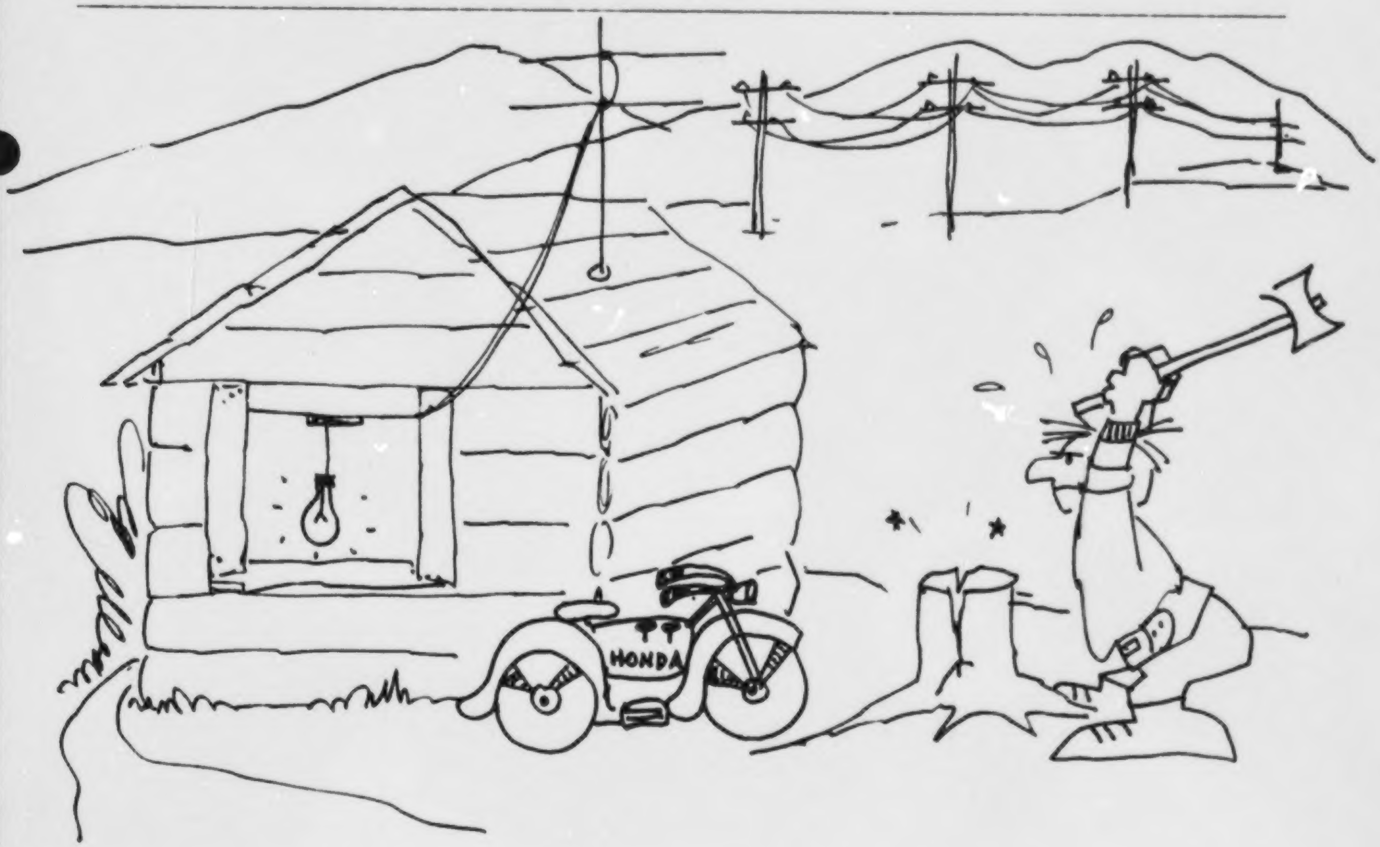
Today we have many electric appliances that help us around the house, entertain us, and make our lives easier. In 1900 very few homes had electricity. Those that did used it mainly for lighting. People cleaned their homes with brooms, mops, and dust cloths. They bought ice every few days to keep their food cold and fresh.

People in the United States today own many electric appliances, from big refrigerators and washing machines to small electric razors and can openers. Over 100,000,000 appliances a year are manufactured in the United States alone.

How does this affect our environment? Where do the materials come from to make the appliances? Where does the electricity to run the appliances come from?

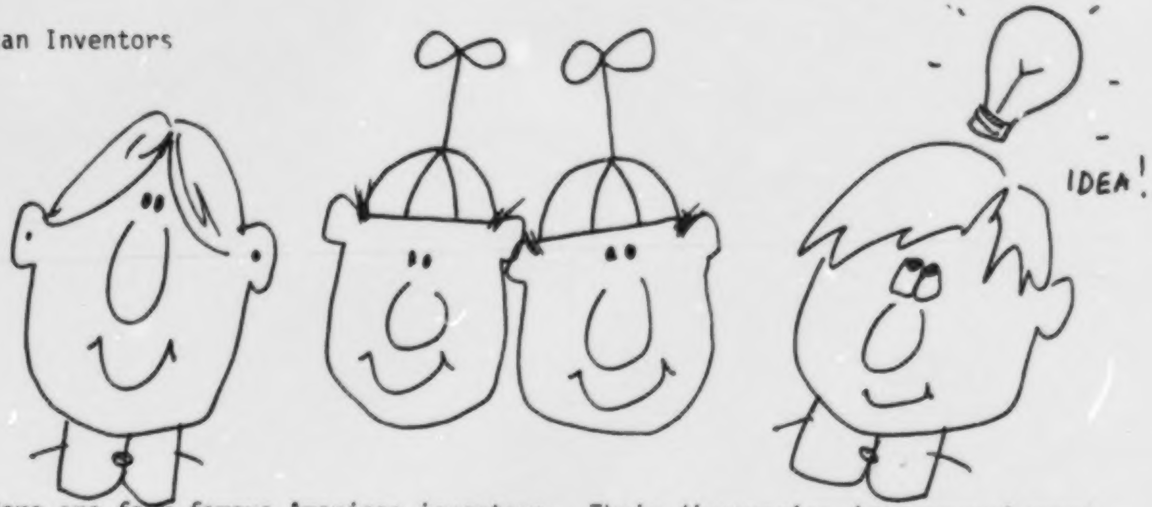
DIRECTIONS: In the picture below, cross out the things that are wrong.

A PIONEER CABIN IN 1850



Name ________________________________

American Inventors



Here are four famous American inventors. Their discoveries have caused great changes in the way people live and in the environment.

DIRECTIONS: After each person, write the name of his invention. Answer the questions.

Henry Ford ______________________

How did this benefit people? ______________________________

What effect has it had on our environment? ______________________________

Wilbur and Orville Wright ______________________

How did this benefit people? ______________________________

What effect has it had on our environment? ______________________________

Thomas A. Edison ______________________

How did this change the way people live? ______________________________

What effect has it had on our environment? ______________________________

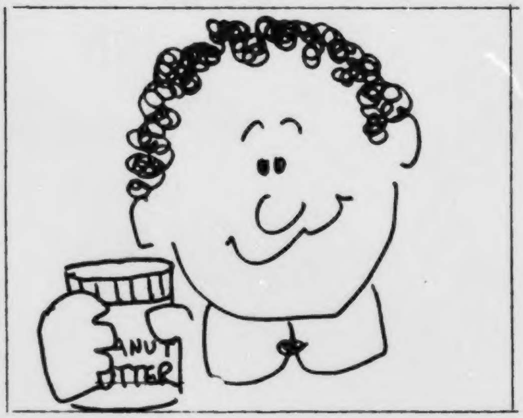
Name ______________________________

Here are four Americans who made great contributions to our environment.

DIRECTIONS: Write the correct name under each picture.

John Chapman George Washington Carver Luther Burbank John Muir

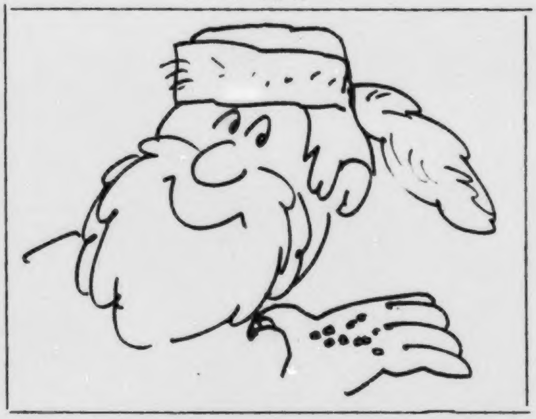
1864-1943



____

American educator and botanist. Found hundreds of uses for peanuts and sweet potatoes. Invented peanut butter.

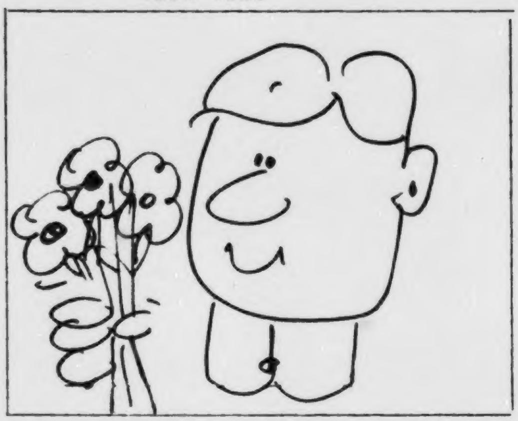
1775-1847



____

American nature lover and folk hero. Well known for kindness to animals and love for apple trees. Nicknamed Johnny Appleseed.

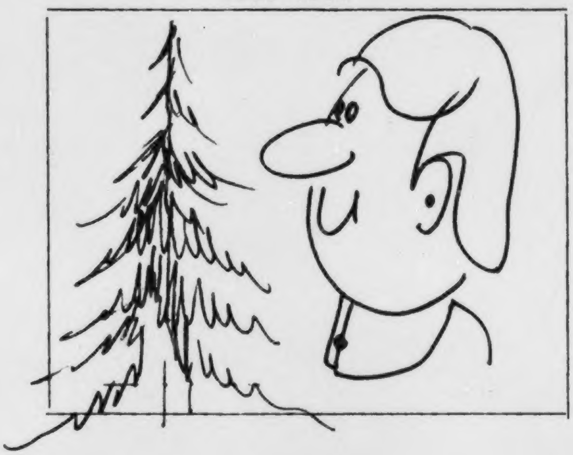
1894-1926



____

American plant breeder. Discovered many new varieties of plants and found ways to improve them.

1838-1914



____

American naturalist and explorer. Promoted the establishment of natural parks in the United States.

Name ______________________________

DIRECTIONS: Thomas Edison and Benjamin Franklin were two great American inventors. Read the story. Fill in the clue words to read the quotations.

Thomas Alva Edison probably invented more things than any other man in history. His most famous invention was the 10 4 16 7 4 17 11 18 16 11 4 13 12 10 5 2 13 14 15 12 14. He also invented the record player. Another word for record player is 1 2 3 4 3 5 6 7 1 2. Other inventions include the mimeograph machine and the 8 3 9 10 11 projector.

Thomas Edison said, " 5 11 4 10 15 18 10 18 3 4 11 1 11 6 16 11 4 13 10 4 18 1 10 6 7 13 10 3 4 7 4 17 99 1 11 6 16 11 4 13 1 11 6 18 1 10 6 7 13 10 3 4."

Benjamin Franklin was energy conscious 200 years before the expression was invented. He discovered the lightning 6 3 17. He also invented a free standing stove to burn 19 3 3 17 which is still used today. Other inventions include the rocking chair, bifocal glasses and 17 7 20 12 10 5 2 13 saving time.

Benjamin Franklin said, " 3 4 11 13 3 17 7 20 10 18 19 3 6 13 2 13 19 3 13 3 8 3 6 6 3 19 18."

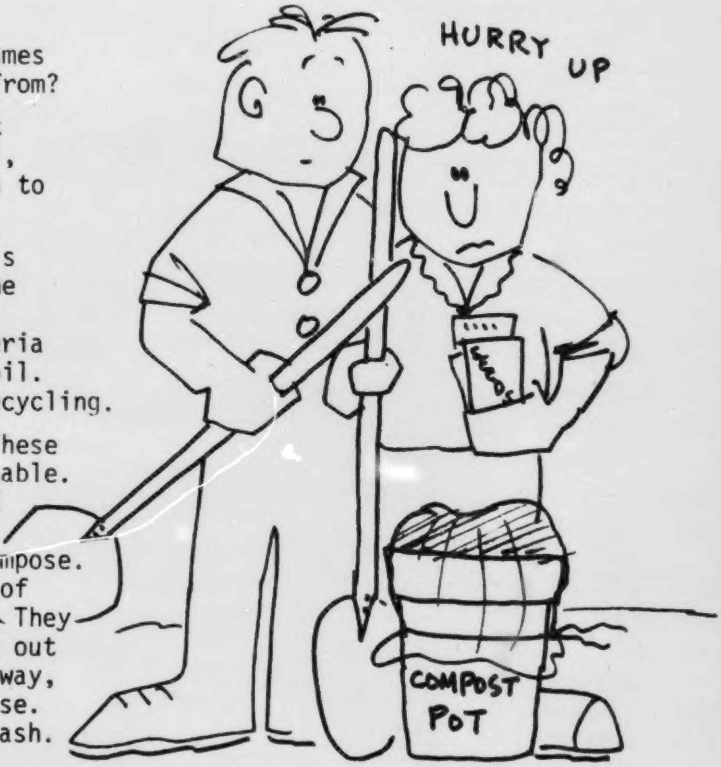
Name ______________________________

Have you ever wondered where the names "Mother Earth" or "Mother Nature" came from?

These names came from the fact that everything comes from the earth, or soil, and, sooner or later, everything returns to the earth.

We know that dead plants and animals decay or decompose and become part of the soil. Other materials rot or decompose and become part of the soil, too. Bacteria helps this process which enriches the soil. This decomposition is nature's way of recycling.

Some materials decompose easily. These things or materials are called biodegradable. Dead plants and animals, food waste, and most paper is biodegradable. But, some materials take a long, long time to decompose. Plastic, glass, and metals are examples of materials that do not decompose easily. They are not biodegradable. When things made out of plastic, glass, or metal are thrown away, it takes a long time for them to decompose. These materials can make mountains of trash.



DIRECTIONS: People can help to get rid of the growing piles of trash and materials that are not biodegradable.

Write the first letter of the underlined words in the story. __ __ __ __ __ __ __

Unscramble the letters to find a way to get rid of materials that do not decompose easily.

__ __ __ __ __ __ __

Try this . . .

You'll need:
- large clay flower pot
- top soil
- plastic wrap
- pebbles
- small pieces of litter (paper, plastic, metal, broken glass, food scraps, etc.)

First, cover the hole in the bottom of the pot with the pebbles. Fill about 1/3 with top soil. Add a layer of the collected litter. Cover the litter with another layer of top soil.

Then, sprinkle with water. Cover the pot with plastic wrap and set it in a warm, dark place. Keep the soil moist.

After two or three weeks, dump the contents onto a newspaper. Which materials have started to decompose? Which have not?

Put it all back in the pot and repeat the above. Check again in another two weeks.

Name ______________________________

DIRECTIONS: Read the story. Use the back of your paper to answer the questions.

Pollution

Pollution by people has caused great changes in the environment. Sometimes people pollute the air, land, or water without knowing it. For example, much of our water pollution has been caused by man's use of detergents and other cleaning materials.

People first used soap to wash their clothes. But soap did not work well in hard water, that is, water that had a lot of minerals in it. Clothes washed in soap and hard water did not get really clean. People wanted cleaner, whiter clothes. So, the soap manufacturers produced a new product, a detergent which made clothes 'cleaner than clean' and 'whiter than white'. Americans had the whitest clothes in the world. But when the detergents went through the sewers and back into the waterways, problems began. The bacteria in the water, which broke down the soaps, had no effect on the detergents. The detergents were not biodegradable. Rivers and lakes became covered with bubbling suds.

Soap manufacturers looked for a new product. They wanted one that would still get clothes whiter than white, but also would be biodegradable. The result was the phosphate detergent. It was biodegradable and the clothes were still whiter than white. Unfortunately, it added more fertilizer (phosphate) to the water. This added fertilizer caused more algae and other water plants to grow. These plants used up the oxygen in the water and as a result, many fish died. When people became aware of this new problem, they wanted to get rid of the phosphate detergents.

Now manufacturers are developing other new products. Some people think these new cleaners may include things that are even more harmful than the detergents and phosphates. We must look carefully at the consequences of adding new materials to our water. It is a high price to pay for 'whiter than white' clothes.

Questions:

1. Who wants whiter, cleaner clothes?
2. Why are detergents harmful to the rivers and lakes?
3. How do phosphates hurt fish?
4. What can you do to stop this kind of water pollution?

Try this . . .

Check to see if your kitchen detergents are biodegradable. In a jar, mix several tablespoons of a detergent with a pint of water. Shake well. Filter the sudsy water through a piece of cheesecloth filled with sand and stones. Shake up the filtered water again. What happens?

Name ______________________________

Minerals

Minerals are an important natural resource. Almost everything we use is made from some type of mineral.

Everyone knows that we are running out of fossil fuel minerals, such as oil and and natural gas, but we are running out of other minerals too. Minerals are natural resources which cannot be replaced or renewed. Our country already uses more minerals than we have. We must buy over half the aluminum, nickel, tin, and zinc we need from other nations.

Some people think the answer is to find more. But, all minerals come out of the ground. How to get the minerals without destroying large parts of our wildlife habitats is a big problem. Some land areas have been ruined by mans' efforts to get coal by strip mining or by hydraulic mining to find gold and silver.

The best answer seems to be to use what minerals we have wisely. Many minerals such as aluminum and iron, can be recycled and used again. Recycling can conserve our natural resources and, at the same time, also helps to get rid of our growing piles of trash.

Follow the directions to answer the riddle.

On space:	Is this object made from minerals?	If yes, put:	If no, put:
1.	Car	T	A
2.	Refrigerator	W	R
3.	Milk	A	E
4.	Nail Polish	N	D
5.	Airplane	T	O
6.	Cotton sock	P	Y
7.	Pencil	F	E
8.	Roller skate	O	T
9.	Plant	G	U
10.	Frying pan	R	A
11.	Plastic dish	C	M
12.	Door key	E	O
13.	Paper	R	N
14.	Soda pop can	T	S
15.	Coin	S	W

RIDDLE: What is the difference between a copper penny and a silver quarter?

__ __ __ __ __ __   __ __ __ __   __ __ __ __ __.
1 2 3 4 5 6   7 8 9 10   11 12 13 14 15

Name ______________________________

Pesticides and Poisons

People have changed the environment through the use of pesticides and poisons. Poisons, such as DDT, have been used to kill flies, mosquitoes, termites, ants and other harmful insects. Farmers can increase their crop production up to six times by using pesticides. This is important because there are many people in the world today who do not have enough food.

Now people have discovered that these poisons last a long time. They do not disappear. Birds die from eating insects whose bodies contain these poisons. Traces of DDT are now found in almost all human bodies, too.

Some people think the answer is organic gardening. Organic gardeners do not use pesticides or poisons. They try to control harmful insects by using natural materials such as soap sprays, sand and ashes, and water. They also make use of good insects, like spiders, ladybugs, and praying mantis, which eat the harmful ones. They even remove the insects by hand. Although this is better for the environment, the amount of food produced is less.

The problem of growing enough food for everyone without using pesticides has not yet been solved.

DIRECTIONS: Fill in the blanks to solve the riddle.

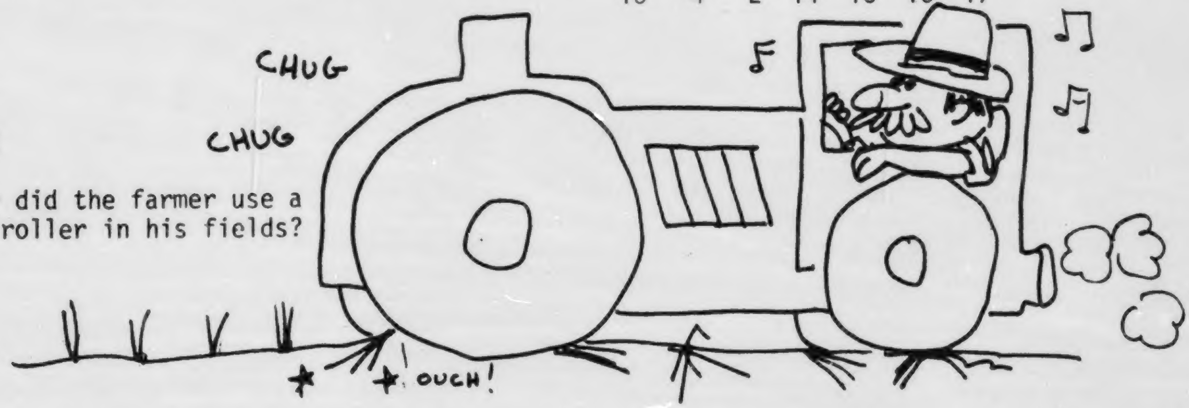
1. Gardening that uses only natural materials is called ___ ___ ___ ___ ___ ___ ___ .
1 2 3 4 5 6 7

2. Another word for insect poison is ___ ___ ___ ___ ___ ___ ___ ___ ___ .
8 9 10 11 6 7 6 12 9

3. Insects that cause disease or eat crops are ___ ___ ___ ___ ___ ___ ___ .
13 4 2 14 15 16 17

RIDDLE

Why did the farmer use a steam roller in his fields?



___ ___ W ___ ___ ___ ___ Y ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
13 9 W 4 10 11 2 Y 6 5 3 11 1 2 4 6 10 9

___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ .
14 4 10 13 9 12 8 1 11 4 11 1 9 10

Name ______________________________

What's Happening to our Wildlife?

The destruction of wildlife is one way man has changed the environment.

Many animals have been killed by people. Millions of predators, such as foxes, coyotes, wolves, mountain lions, hawks, and owls, have been killed to 'protect' ranch and farm animals. Today, as a result, many crops are threatened by rats, mice, and other rodents. We have upset the balance of nature.

Over the past years, many other animals were killed for sport. The buffalo, also known as the American bison, almost became extinct. In 1870 there were over fifty million buffalo in the United States but in 1889 only 551 could be found. Early train passengers used the buffalo for target practice by shooting them from the windows of the moving trains. Now the buffalo is protected by law and it is estimated that there will be over a half million by the year 2000.

Other animals are killed for fur or food. The passenger pigeon was killed for food until it became extinct. Many fur bearing animals are on the endangered animal list because of over trapping and hunting.

But, the biggest problem facing wildlife today is the loss of their habitats. Our growing population needs more land to build houses, factories, and highways. We have drained swamps and filled in baylands to make room for more buildings and roads. What happens to the animals that lived there?

Even animals that have not lost their habitats and are not sought after for food, fur, or sport are in danger. The increasing water and air pollution and the wide use of pesticides and poisons are other problems for wildlife.

We must learn to share the earth will all living things or our own survival may be in danger.

William F. Cody was nicknamed "Buffalo Bill". Use the code to find out why.

DIRECTIONS: Change each letter or numeral to the one that comes before.
Example: SJHIU = RIGHT

IF LJMMFE 5,972 CVGGBMP JO POF TFBTPO.

__ ______ _ ___ _______ __ ___ ______

Do you think he would have been proud of this today?

Name ______________________________

DIRECTIONS: Fill in as many boxes in each category as you can. Be sure the words you write in begin with S, T, R, O, N, and G.

CATEGORIES

	WILDLIFE	ENERGY SOURCE	POLLUTION PROBLEM
S	1	1	1
T	1	5	2
R	2	3	3
O	3	2	3
N	5	1	5
G	2	3	2

Add up the points for all the boxes in which you wrote answers.

What was your total? Maximum number of points is 45.

Remember we all have to work together to keep our environment STRONG and healthy.

RELATED ACTIVITIES

The following pages are ideas for integrating conservation activities with areas of the curriculum other than language arts, math, social studies and science. These activities are samples of those included in the 'All Levels' Guide which is the seventh book of the Conservation For Children series.

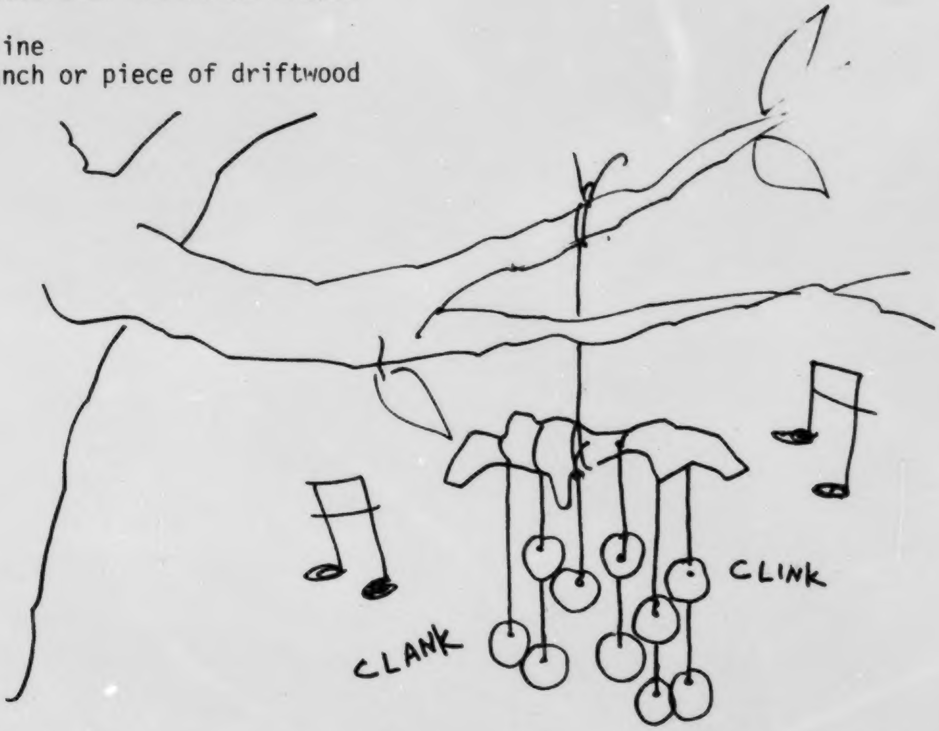
The 'All Levels' Guide contains activities and ideas for art, music, growing plants, and classroom projects, as well as student and teacher bibliographies. The activities and ideas are applicable to many grade levels.

Wind Chimes

The energy of the wind can even make beautiful music for you.

Things you will need:

- Ceramic clay (red or white)
- Rolling pin or wooden dowel
- Cookie cutters of different shapes
- String
- Fishing line
- Small branch or piece of driftwood

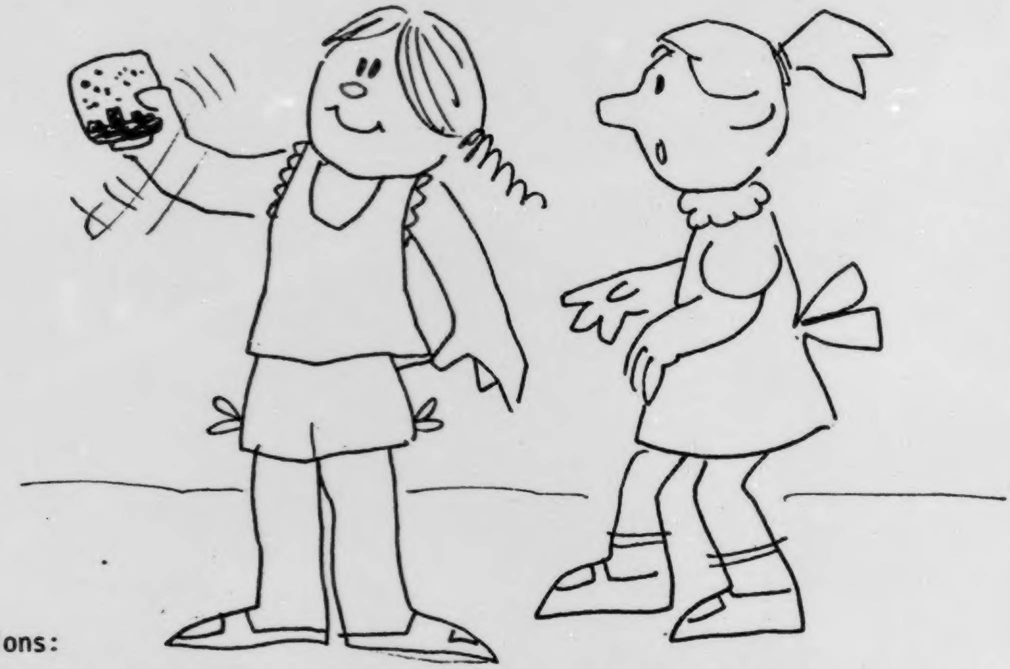


1. Use the rolling pin or dowel to roll the clay to about 1/4 inch thickness. (The back of oilcloth or newspaper makes a good rolling surface.)
2. Cut out desired shapes with cookie cutters. Three or four pieces makes a nice wind chime. Make a hole about 1/2 inch from the edge of each piece.
3. Let all pieces air dry. Fire in kiln.
4. Thread each piece with fishing line and attach to branch or driftwood. Hang pieces at different levels but allow them to touch or there will be no music.
5. Tie string to branch and hang in a breezy place.

SNOW SCENE JARS

Materials needed:

Baby food jar with lid
Silver glitter
Glycerine
Small objects to make scene (twigs for trees, pebbles, plastic toys)
White glue
Water



Directions:

1. Make a stand-up scene on inside of lid. Glue objects securely in place. Let dry.
2. Fill bottle carefully with glycerine until 3/4 full. Fill the rest with water.
3. Add about one teaspoon of glitter.
4. Screw top on tightly. Invert and watch the 'snow' fall. Shake the jar gently to see a full snow storm.

(Another way is to use water and 2 tablespoons of moth flakes. You may want to coat the jar lid with water proof cement and screw it on tight.)

CRYSTAL GARDENS

Materials needed:

Several chunks of porous materials, such as tanbark, driftwood, cork, pieces of sponge or brick.

Aluminum pie plate

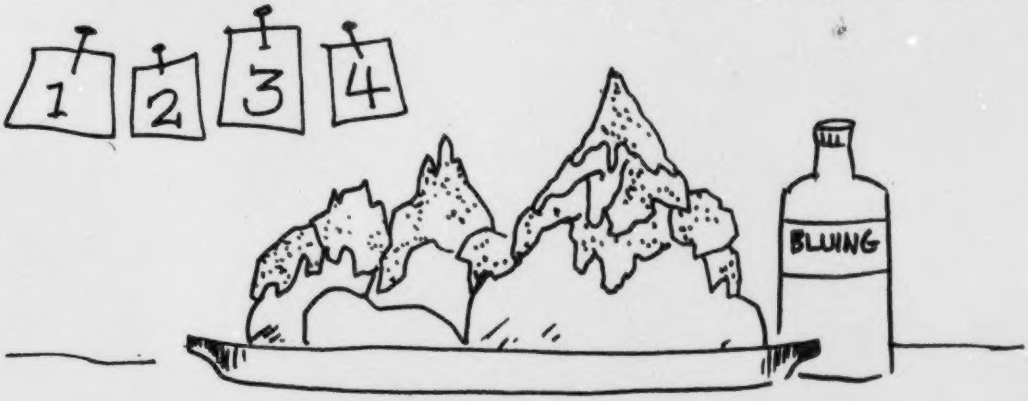
Solution

4 tablespoons noniodized table salt
4 tablespoons liquid bluing
4 tablespoons water
1 tablespoon ammonia

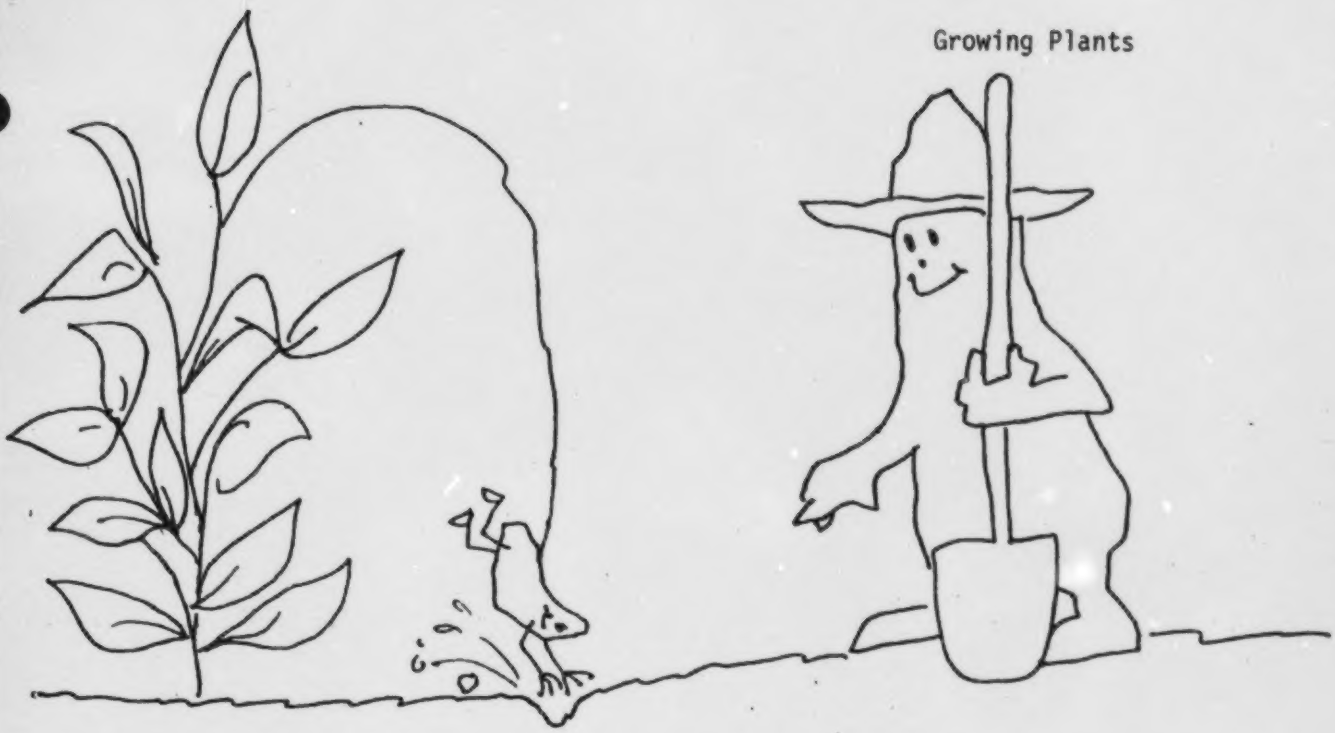
Food coloring, one or two drops

How To Do It:

1. Arrange porous materials in aluminum pie plate.
2. Spoon solution over the materials. Make sure that the solution covers the bottom of the container.
3. Drop a little food coloring over the 'garden'.
4. Set the pie plate where you won't have to move it for the next four days.



As the liquid travels to the surface, the water in it evaporates, leaving a saturated salt solution. Salts crystallize from this and keep growing until the solution dries out.



GROWING PLANTS FOR PEANUTS

What You Need: Unshelled raw peanuts (not roasted), small glass jar, piece of yarn, potting soil, 8" pot.

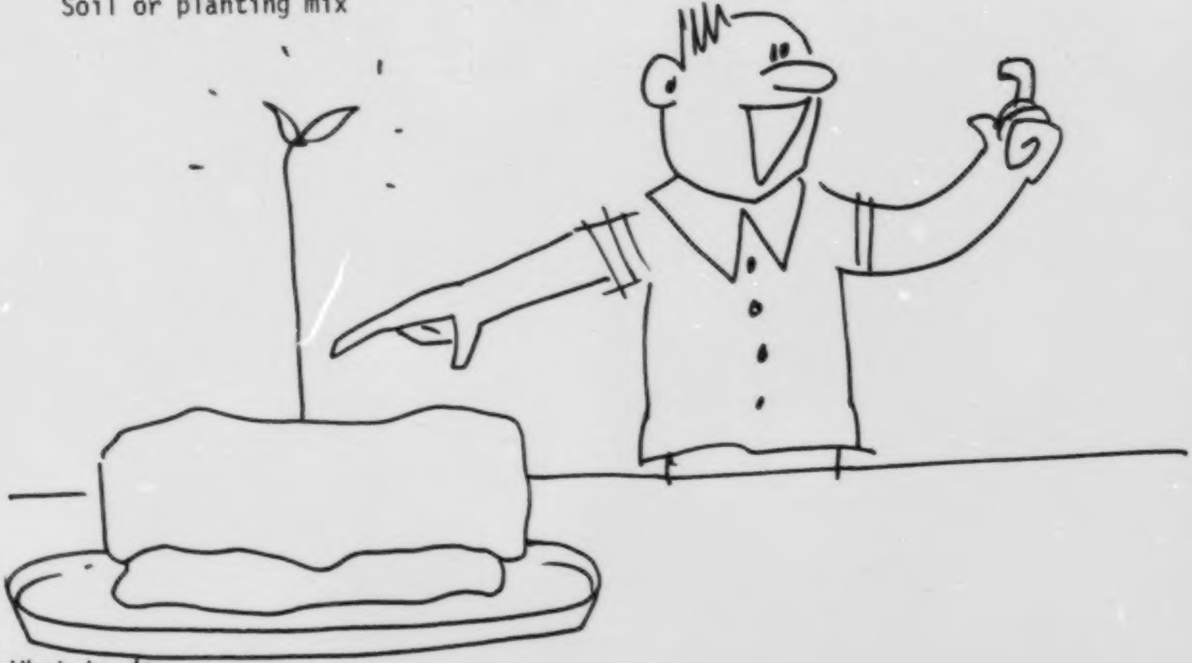
How To Do It: Carefully remove the shell and take out the peanuts. Be sure to leave the red skin on. Soak the peanuts in water overnight. The next day put the peanut on top of some yarn in a jar. Add a teaspoon of water and check every day to keep the yarn moist. Soon the nut will grow a root. When the root is three inches long, plant the peanut in an 8" pot. In about seven weeks the plant will grow yellow flowers. After each flower pollinates, it will fall off. A sort of green finger called a peg will emerge and find its way back into the soil. That's the part that will become the peanut. In another four to six weeks, when the green part of the plant begins to turn brown, it's time to harvest the peanuts. Take hold and pull the whole plant up. Let the plant dry in the air for a few weeks, then remove the peanuts.

If you want to roast your peanuts, soak them in salted water overnight. Then spread them in one layer on a cookie sheet and put it in the oven at 350° for about 30 minutes.

A Sack of Potatoes

Things you will need:

2 or 3 white potatoes
a sturdy plastic trash can liner (about 17"x18")
gravel or small pebbles for drainage
a pan or saucer to catch the drain water if you're going to do this indoors.
Soil or planting mix



What to do:

Fold the plastic bag over at the top a couple of times to make a three inch cuff so that the bag will stay open neatly at the top. Put about ½ inch of gravel in the bottom of the bag and punch a few holes in the bottom to allow for drainage. Add soil up to within three inches of the top. Cut the potatoes into pieces so that eacy piece has two or three eyes (buds). Plant these pieces in the bag about four inches apart. Cover the potatoes with a few inches of more soil.

Water and put the bag in a sunny place. If you plant your potatoes in March or April, you will have a sack full of potatoes by the fall.

This Land Was Made for You and Me??

Modern words by Jerry Smith.

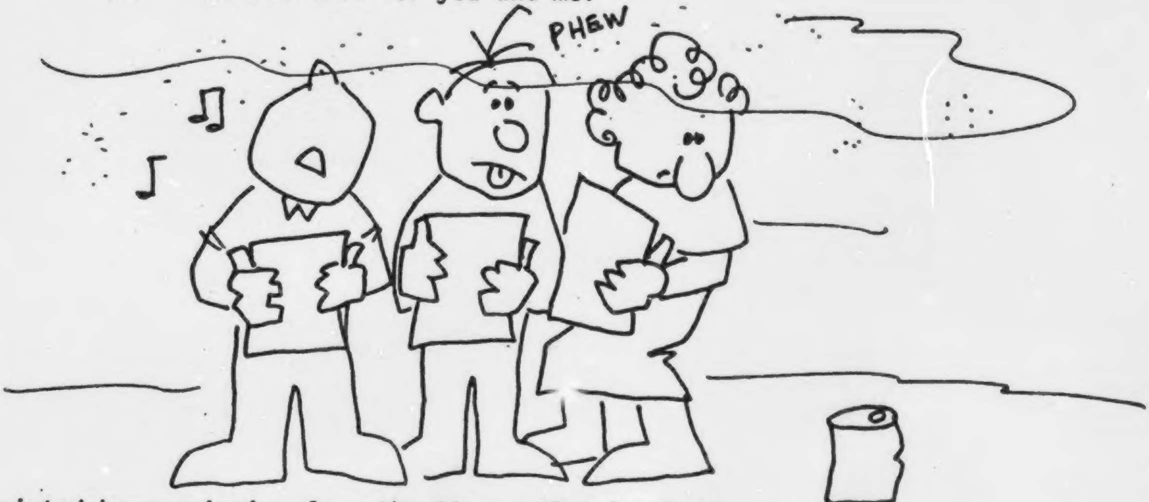
Chorus:

This land was your land, this land was my land,
From Los Angeles to Coney Island,
From the logged off forests, to the dirty waters,
This land was made for you and me.

1. As I was walking that ribbon of highway,
The sound of chain saws echoed over the skyway,
And the Redwoods falling,
And the loggers calling,
"This land was made for you and me."

2. I've roamed and rambled,
And I've followed the beer cans,
From the toxic cities to the flooded canyons,
And all around me,
Were the billboards reading,
"This land was made for you and me."

3. The sun came shining, but the hazes hid it,
And cloaked the factories and cars that did it.
As the smog was drifting,
Someone was coughing,
"This land was made for you and me."



Reprinted by permission from the, Sierra Club Songbook.

Many people are working together to keep our environment clean and healthy for all living things. They will send you information that tells how you can help.

Remember, it takes energy and natural resources to make these materials, so only send for the things you really want to know more about.

Things to Send For ....

Mr. Peanut's Guide to Ecology

This is a 22 page booklet that tells about our 'spaceship earth'. It has lots of ideas on how we can conserve our natural resources.

Write to: Standard Brands Educational Service
Box 2695
Grand Central Station
New York, N.Y. 10017

It's free.

Once There Lived a Wicked Dragon

This is the story of our growing pollution problem and what you can do about it.

Write to: Solid Waste Information Materials Control Section
U.S. Governmental Protection Agency
Cincinnati, Ohio 45268

Ask for booklet No. SW 105.1. It's free.

Energy Activities with Energy Ant

Here's a way to find out about the history of energy from dinosaur days to modern solar heated houses. The activities included dot to dots, crossword puzzles, and other fun things to do.

Write to: Federal Energy Administration
Office of Communications and Public Affairs
Washington, D.C. 20461

It's free.

Environmental Bingo Game

This is a new way to play Bingo and learn about environmental problems and solutions, too.

Write to: Conservation Committee
Garden Club of America
598 Madison Ave.
New York, N.Y. 10022

Send 10¢ for postage and handling charges.

618

GOODY'S
PEANUT
BUTTER
YUM! YUM! YUM!

MORE THINGS TO KNOW ABOUT PEANUTS

One pound of peanuts contains more food value than a pound of beef steak.

The peanut is not a nut but rather a pea that looks like a nut. That's why it's called a 'peanut'.

About a hundred years ago, cotton crops were all being destroyed by an insect called a boll weevil. Peanuts were immune to the boll weevil and were planted to save the land and the farmers.

President Carter's family owns a large peanut farm.

Peanuts enrich the soil with nitrogen, a valuable plant food which most plants steal away from the soil.

George Washington Carver invented hundreds of ways to use peanuts. He made peanut fudge, peanut soup, peanut cheese and, of course, peanut butter.

You can get more information about peanuts from:

Peanut Food Promotions
P.O. Box 1709
Rocky Mount, North Carolina
27801

STUDENT BIBLIOGRAPHY

Here are some good books to read about conservation and pollution problems. Some may be in your school library. The others can be found in public libraries and book stores.

1. The Giving Tree, Shel Silverstein, Harper and Row Co., N.Y.
   This is a wonderful story about the relationship between a tree and a man.
2. Seal Song, Brian Davies and Eliot Porter, Penguin Books
   Beautiful photographs of the harp seals and the hunting dangers they face.
3. It's Your Environment, Environmental Action Coalition, Chas. Scribner's Sons.
   Lots of information and things to do to fight pollution.
4. A Changing World for Wildlife, George Fichter, Golden Press, Western Pub. Co.
   Presents problems faced by animals.
5. The Earth Book, Gary Jennings, J.B. Lippincott Co.
   Suggestions to save our earth.
6. Bird of the Farallons, Harriett Luger, Addison-Wesley Pub. Co.
   Tells about the effects of oil spills on birds.
7. The World You Inherit, John G. Navarra, Natural History Press
   The story of our polluted planet.
8. The Only Earth We Have, Lawrence Pringle, Macmillan Co.
   Problems confronting the earth today.
9. Litter - The Ugly Enemy, Dorothy Shuttlesworth, Doubleday and Co.
   Litter pollution and what you can do about it.
10. The Last Free Bird, A. Harris Stone, Prentice-Hall Inc.
   How birds' habitats are endangered by man.

Add the titles of other books about conservation.

11.

12.

13.

14.

15.

16.

17.

18.

620

Name ______________________

DIRECTIONS: Read the story to answer the questions at the bottom of the page.

The Energy Crisis

For the past century, our country has depended mainly on fossil fuels to provide for our energy needs. Valuable fossil fuels, such as natural gas and low sulphur oil, are used to generate electricity in most parts of the country. Even though we have a large amount of our own natural resources, we are now using so much that we have to import some of these fuels from other countries. If we continue to use up these fuels at our present rate, they will soon be gone.

Other fuels for generating electricity must be found. Utilities, industry, and the government are working to find new fuels and to develop other ways of generating electricity. But, this takes time and is costly.

In the meantime, we can all help to ease the crisis by using less energy. It is up to each of us to be "waste watchers" and make certain we and our families are using energy efficiently and wisely.

One reason to conserve energy is to preserve our natural resources for future generations. Another important reason is to help our country to be self-sufficient and not have to rely on fuels from other countries. A third reason is to lower our monthly utility bills. By using less electricity at home, we can save money and energy too.

List three reasons why people should try to conserve energy.

1. save natural resources
2. help our country to be self-sufficient
3. saves money

Name ______________________

DIRECTIONS: Use the words in the box to fill in the blank spaces in the story. Read the story again to be sure it makes sense.

future	shortages	civilization	cleared	solutions
relatively	consequences	abundance	cultivated	plentiful

Man and His Environment

Although man has been on the earth for a relatively short time, he has caused many changes in the environment.

He has Caltivated some of the wild plants to use for food, clothing, and building materials. He has tamed wild animals for food, clothing, pets, and for transportation. Man has cleared large forest areas which once covered most of the earth to make room for cities, roads, and to supply materials for building needs. He has searched the earth for minerals and oil and refined them for use as fuel, materials for housing and industry, and to make tools and machinery for our growing population.

Man has built a great civilization using the natural resources of the environment. But, until recently, he has given little thought to the Consequences of the changes he was making. At first, there was a great abundance of natural resources. There was so much land and food available that man had no thought of any shortages. Wildlife was plentiful and clean air and water could be found almost anywhere.

Now we are aware that many of these natural resources are limited. We know that we must use greater care and thought in how we use them. The growing problems of population, pollution, and poisons are important for us to understand in order for us to find solutions. The future of o environment depends on us.

Name ______________________

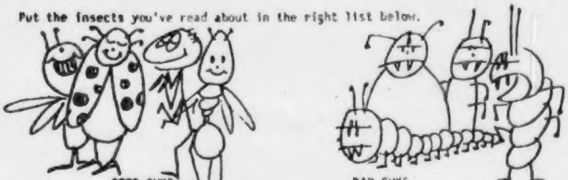
Garden Pests ?

All gardens have bugs, or insects. They are part of nature's food chain. In a small garden, the best way to get rid of bugs that are eating your plants is to hunt them down and remove them by hand. Smaller insects can be destroyed with a bath of soapy water which will not hurt your plants. Another way to get rid of bad bugs is to use good bugs. Many bugs depend on other bugs for food. Poisons or insecticides should be avoided because they kill the good bugs as well as the bad ones.

Insects can be divided into two main groups - the kind which mainly eat plants (the bad guys) and the kind which mainly eat other bugs (the good guys). Learning the difference between the good guys and the bad guys can help your garden.

Caterpillars, slugs, and cutworms are plant eating insects. They can eat the tender, young leaves of your plants almost as fast as you can. Aphids and spider mites suck the juices from plants. You can often find them on the undersides of plant leaves. Ladybugs and lace wings are insects that like to eat aphids and spider mites. A single ladybug can eat fifty aphids a day! Praying mantis and garden spiders also catch many harmful insects. Ground beetles are very good at getting rid of slugs, caterpillars and cutworms.

Put the insects you've read about in the right list below.



GOOD GUYS	BAD GUYS
ladybugs	caterpillars
lace wings	slugs
praying mantises	cutworms
garden spiders	aphids
ground beetles	spider mites

Name ______________________

DIRECTIONS: Use the words in the box to fill in the blank spaces in the story. Read the story again to be sure it makes sense.

rise	pipelines	dug	refineries	animals	pumped
beaches	fossil	result	coats	tankers	drilling
accident	problem	periods	coal		

Oil, coal and natural gas are fossil fuels that are found de under the ground. Coal mines are dug into the ground to remove th Coal. Natural gas and oil are obtained by drilling wells to reach the underground supply. Natural gas tends to rise by itself and can be easily transported through pipelines. Oil, or crude petroleum, must be pumped up and separated into its various parts in refineries. Oil can be transported across country by pipeline or overseas in huge ocean Tankers.

If an accident occurs in transporting the oil across the oceans or as a result of offshore drilling, oil spills may result. The spilled oil coats the water for miles around. It kills birds and sea animals and can make beaches useless for recreation for long periods. Oil pollution is a problem on many coastlines.

Name ______________________

GEOTHERMAL ENERGY

(1) Geothermal energy comes from water heated by molten rock many thousands of feet beneath the earth's surface. Until now it has been only available in areas where reservoirs of underground water exist naturally. The PG&E Company operates such an energy plant in the geyser area north of San Francisco.

(2) Many other countries have had success in using geothermal power. Mexico, Italy, New Zealand, and Iceland all have geothermal energy plants in use. In Iceland, geysers and hot springs are a common sight. The people there have used this energy source to produce large amounts of food in naturally heated greenhouses.

(3) Scientists think that they are finding ways to use geothermal energy in other areas too. They are drilling into hot, dry underground areas, pumping in cold water, and letting the earth heat the water. They are presently trying this method in New Mexico. If they are successful, geothermal energy plants could be built anywhere that hot, dry rock is available within 25,000 feet of the earth's surface.

(4) Some scientists are concerned that the cracking and disturbance to the underground rock could create earthquakes. They are also worried that by using the underground water we might change the earth's surface. Another problem involves the strong minerals contained in the underground water which could ruin machinery.

(5) Most people, however, are in favor of geothermal energy because it does not add pollutants to the air. It is one of nature's clean sources of natural energy.

DRAW A LINE UNDER THE BEST TOPIC SENTENCE FOR EACH PARAGRAPH

Paragraph 1

1. There are many geysers north of San Francisco.
2. Geothermal energy has been limited to natural geyser areas.
3. The PG&E is a power company.

Paragraph 2

1. Many countries are developing geothermal power.
2. There are numerous geysers in Iceland.
3. Greenhouses can be heated with geothermal energy.

Paragraph 3

1. Hot, dry rock is available in New Mexico.
2. Energy plants can be built 25,000 feet beneath the earth's surface.
3. New ways to expand geothermal energy are being sought.

Paragraph 4

1. There are problems to be solved in using geothermal energy.
2. Geothermal energy might cause earthquakes.
3. Underground water contains many minerals.

Paragraph 5

1. Everyone likes geothermal energy.
2. Geysers are very popular.
3. Geothermal energy is a non-polluting power source.

Name ______________________

Endangered Species

While most animals are safe, too many are extinct or in danger of becoming extinct. It is a good idea to remember that animals can live without man, but man cannot live without animals. To tell how safe or in danger our animals are, the following descriptions are used.

SAFE - An animal whose population is steady or even increasing. Nothing seems to be threatening it.

THREATENED - A species whose numbers are low because of pollution, habitat destruction or over-hunting. It could start dying out if it is not protected.

ENDANGERED - Those animals whose population has gone down so much that they are in great danger of dying out. Even with protection it may not survive.

EXTINCT - Those species that have died out either from natural causes or because of man.

The grizzly bear is one of the most powerful animals in the world. But man is threatening it by killing it and destroying its wilderness habitat.

Because of man the passenger pigeon is now extinct. But many prehistoric animals became extinct before man appeared on earth.

There are not as many Rocky Mountain bighorn sheep now as there have been because man's livestock has taken over many of their grazing areas. At present this animal is thought to be safe.

The peregrine falcon and the southern bald eagle are endangered because of pesticides, loss of habitat and illegal killing.

Packs of timber wolves once hunted all over North America. Now certain kinds are endangered because man has killed many of them and destroyed their habitats.

Write safe, threatened, endangered or extinct in the blank spaces.

1. The peregrine falcon is endangered.
2. The passenger pigeon is extinct.
3. The grizzly bear is threatened.
4. The Rocky Mountain bighorn sheep is thought to be safe.
5. The southern bald eagle is endangered.
6. Timber wolves are endangered.

Name ______________________

DIRECTIONS: Read the story. Use the context clues to match the underlined words to their definitions at the bottom of the page.

Letting Wild Animals Go

Some people have tamed wild animals to be pets. Raccoons, tortoises, snakes, and many types of birds are some of the animals that are often kept as pets. Many well-meaning people who have these wild animals feel that they should let their pets go free to return to their natural habitats. This should not be done for several reasons:

1. Research shows that a captive has less than a 10% chance of surviving the demands of his natural habitat. The soft life of captive living makes it difficult for animals to adapt to their wild habitats.
2. Captive pets can have or transmit diseases to the other wild animals.
3. The food supply of an area may not be enough to support another animal. Adding your pet to the habitat is another way of upsetting the 'balance of nature'.

The best thing to do if you cannot keep your pet is to give it to someone who will care for it. Do not turn it loose!

Write the letter of the definition in front of the correct word.

C	habitats	A - caged or contained in an unnatural setting
H	research	B - needs, requirements
A	captive	C - surroundings, home of an animal
G	surviving	D - pass on to, infect
B	demands	E - fit into different conditions or settings
E	adapt	G - staying alive
D	transmit	H - studies of past events or facts, investigatio
I	upsetting	I - disrupting, disturbing, changing

Name ______________________

How can a farmer harm pelicans that live five hundred miles away from him?

Farmers grow most of the food that we eat today. They often use pesticides to kill harmful insects that destroy their crops. Many times these pesticides kill other animals, too.

First, the farmer sprays his crops with the pesticides to kill the insects. When it rains, the pesticides are washed into creeks and rivers. These pesticides cling to tiny plants in the water that are eaten by fish. As the river is flowing to the ocean, some of these fish are eaten by bigger fish. The big fish are then eaten by birds, such as pelicans.

The pesticides can cause changes inside the pelicans' body. They cause the pelicans to lay eggs that have very thin shells. Sometimes the eggshells are so thin that they break when the mother or father pelican sits on the nest. In 1969, six hundred pairs of pelicans on Anacapa Island, off the coast of California, were able to hatch only five babies. And in 1970, only one egg was hatched. If no baby pelicans are born, soon all the pelicans will be gone.

Put numbers in front of the sentences to show the order in which they happen.

4 Birds, such as pelicans, eat the fish.
2 Pesticides drain into creeks and rivers.
5 The pesticides cause changes in the pelicans' body.
1 The farmer sprays his crops with pesticides to kill the insects.
3 The pesticides stick to tiny water plants and are eaten by fish.
6 No baby pelicans are born.

Answers 514, 515, 516, 517

Name ______________________

How to be an ORGANIC Gardener

Organic gardening is 'natural' gardening. It means putting more into the soil than you take from it.

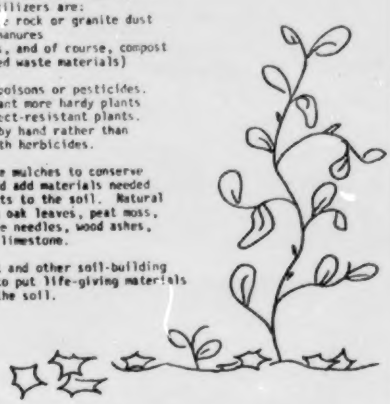
To become a good 'organic' gardener you must know the rules.

Rule 1. Use natural fertilizers rather than artificial fertilizers. Some good natural fertilizers are:
- phosphate rock or granite dust
- animal manures
- minerals, and of course, compost (recycled waste materials)

Rule 2. Do not use poisons or pesticides. Instead, plant more hardy plants or more insect-resistant plants. Pull weeds by hand rather than spraying with herbicides.

Rule 3. Learn to use mulches to conserve moisture and add materials needed by the plants to the soil. Natural mulches are oak leaves, peat moss, decayed pine needles, wood ashes, or crushed limestone.

Rule 4. Use compost and other soil-building materials to put life-giving materials back into the soil.



Test your knowledge. Answer the questions 'true' or 'false'.

1. Organic gardening is good for the soil. true
2. Organic gardeners use insecticides to control bugs. false
3. Mulches, like oak leaves, help to keep the soil moist. true
4. Compost is a natural fertilizer. true
5. Herbicides are used by organic gardeners to get rid of weeds. false

---

Name ______________________

Here are some new words to learn.

Biodegradable: material that is able to be readily decomposed (dissolved or broken down) by biological means, especially bacterial action.

Natural resource: the wealth of materials supplied to us by nature, such as coal, oil, water power, rich soil, etc.

Organic: involving the basic makeup of a thing. When used with gardening it means grown with only animal or vegetable fertilizers like manure, compost, etc.

Use the correct word in the sentences.

1. The wood from trees in our forests is a natural resource.
2. Using eggshells and coffee grounds in our gardens is a way of Organic gardening.
3. Plastic will not dissolve so it is not biodegradable.
4. Minerals in the earth are another natural resource
5. Most papers will dissolve easily, so we know they are biodegradable.

See how many animal names you can make out of the letters in the word:

BIODEGRADABLE

__________ __________ __________

__________ __________ __________

More?

Name ______________________

DIRECTIONS: Read the story. Below the story are some new words. Draw a line from the word to its meaning.

Our Changing Farmlands

The United States loses approximately three million acres of land a year to new houses, industry, parking lots and roads. Much of this land was once used for growing food.

Today the central valley of California is still farming land, but the style of farming has altered. The small farmer, who was once a proud and vital part of our nation, is finding it harder and harder to survive. The lands around him are slowly being sold to housing developers. Developers like to build houses on flat farmlands because it is easier and cheaper to build there than on hillsides. As the houses are built and sold, the land prices begin to rise. Property taxes are also increased. The small farmer often finds that his crops do not sell for enough money to pay the increased taxes.

More and more small farmers eventually sell their lands to the housing developers or to large corporate farms. Corporate farms are owned by large companies that often pay less taxes than individual farmers. They also can increase the crop yields through the use of extensive machinery. It is estimated that 60% of all farmland in the United States is now owned by corporations.

altered	made greater, gain in number
vital	amount produced
increased	sooner or later, in the end
eventually	necessary to life
yields	changed

Name ______________________

DIRECTIONS: In each sentence there is an underlined word that you may not know. Use clues in the sentence to decide what the word means. Circle the word below the sentence that means almost the same as the underlined word.

1. Until 1970 almost all furnaces and engines were powered by fossil fuels.
   chairs [✓ heaters] automobiles people
2. These fossil fuels include coal, petroleum, and natural gas.
   dogs minerals [✓ oil] rocks
3. Of these three, coal is the one that has been utilized the longest.
   [✓ used] produced sold saved
4. Of all the fossil fuels, coal reserves are the most plentiful.
   [✓ largest] cleanest cheapest easiest
5. It is also the most extensively used fuel today.
   best [✓ widely] costly safely
6. There are disadvantages in using coal as fuel.
   gains reasons benefits [✓ problems]
7. Coal mining is a dangerous occupation.
   trip [✓ job] risk company
8. Making mines safe for workers is expensive and lowers the owners' profits.
   hard cheap impossible [✓ costly]
9. Transportation of coal is cumbersome and slow.
   cold fast [✓ bulky] easy
10. Heaps of waste materials near mines can turn green countrysides gray and ugly.
   packages [✓ piles] litter conservation
11. Burning coal often creates air pollution.
   [✓ produces] lessens blackens traps
12. For these reasons, many areas are looking for other alternatives.
   places [✓ choices] population decisions

Name ______________________

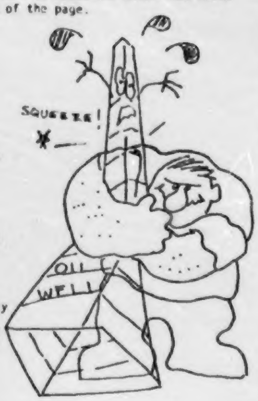
DIRECTIONS: Read the story. Use the context clues to match the underlined words to their definitions at the bottom of the page.

Oil

In the past years we have put most of our fuel burden (74%) on oil and natural gas. They took millions of years to make, are in limited supply, and are becoming harder to find.

Production of oil in the United States hit a high point in 1970 (11.3 million barrels a day). Since then, our output has declined. Even with discoveries of major new oil fields in Alaska and offshore, production won't return to the peak levels of the past. At best, it will stabilize for a number of years. Sooner or later our oil resources will start to wane.

Petroleum (processed oil) is especially important since it is the dominant fuel today for cars, trucks and airplanes. Oil is also vital in the manufacture of many products such as fertilizers, fibers, plastics and pharmaceuticals.



Write the letter of the definition in front of the correct word.

C	burden	A - necessary, could not do without
G	limited	B - highest
F	output	C - load, demand
B	peak	D - decrease, lessen
D	wane	E - leading, most important
E	dominant	F - production
A	vital	G - only so much, not everlasting
H	stabilize	H - steady, become even

522

Name ______________________

DIRECTIONS: Write is or are in the blank spaces.

1. Coal is another source of energy.
2. Coal, oil, and natural gas are fossil fuels.
3. About 19% of our energy is supplied by coal.
4. Black, sooty smoke from burning coal is a big source of air pollution.
5. People are concerned that the heat from burning coal will change our climate.
6. "Acid rains" are created when coal smoke mixes with moisture in the air.
7. Plants and animals are endangered by these acid rains.
8. "Stack gas scrubbers" are machines used to clean the gases produced by burning coal.
9. It is very expensive to clean coal gases.
10. At present usage rates, there is enough coal in the United States to last for 500 years.

523

Name ______________________

DIRECTIONS: The following story about garbage is all mixed up. It needs periods (.) to end the sentences. Put the periods where they belong and be sure to use a capital letter to begin the next sentence.

The Great Garbage Story

Garbage is a problem. People who try to solve this problem call garbage by a special name - solid waste. Solid waste won't go away by itself. It can't disappear into water or air. Picking it up and taking it away is one of the most important jobs that city workers do.

Solid waste wasn't always such a big problem. People in the "olden days" didn't have so much to throw away. They grew their own fruits and vegetables. They killed animals for meat. They didn't shop in stores, so they didn't have a lot of packages.

The people then made their own containers out of clay and plants. They used them over and over. They made simple, sturdy furniture to last for a long time. Worn-out clothes were made into rugs and quilts. Left-over food was eaten by the animals. People long ago had no need for huge garbage cans.

But some things were thrown away. For example, when clay bowls broke, they became solid waste. They were thrown away in open dumps. At first, dumps were small. But as people settled down and built towns and cities, dumps became larger and larger. The first garbage men began to go from house to house with carts and horses. Solid waste began to be a real problem

Today each of us throws away about four pounds of garbage every day. That adds up to 400,000 tons a day in the whole country. Almost all of it is dumped in the same way it was in the "olden days". Only our dumps are much much bigger. There are many more people today and each of us throws away more and more garbage each year.

524

Name ______________________

DIRECTIONS: Write 'statement', 'command', or 'question' in front of each sentence below. Put an X on the space if it is not a sentence. Be sure to complete sentences with the correct punctuation.

X 1. Ways to save energy at home

command 2. Turn off TV, stereo or radio when no one is listening or watching.

statement 3. You shouldn't use your television set to keep you company or put you to sleep.

X 4. Standing with the refrigerator door open while you decide what you want

question 5. How does covering pots with lids shorten cooking time?

command 6. Run dishwashers only with full loads.

statement 7. Planting trees outside will shade your house and keep it cooler.

command 8. Turn lights off when you leave a room.

question 9. Why will washing clothes in cold water save energy?

X 10. Hanging clothes to dry on outside clotheslines on sunny days

statement 11. Taking short showers instead of baths will save water and energy too.

command 12. Close draperies during hot summer days to keep the heat out and the cool air in.

525

Answers 522, 523, 524, 525

Name ____________________

DIRECTIONS: Complete the sentences. Use the clue words to answer the riddle.

1. Using only natural materials in growing things is called organic
G A R D E N I N G.
2 7 13 3 12 14 6 14 2

2. Organic gardeners do not use P E S T I C I D E S.
1 12 10 5 6 4 6 3 12 10

3. They use insects and birds to control B U G S.
16 11 2 10

4. They also pull out weeds by H A N D.
9 7 14 3

5. Vegetable peelings, eggshells and other food wastes can be used to make C O M P O S T.
4 17 8 1 17 10 5

6. Materials used to cover the ground and keep it moist are called
M U L C H E S.
8 11 15 4 9 12 10

7. Compost adds life giving materials back into the S O I L.
10 17 6 15

8. Many people feel organic gardening is better for our
E N V I R O N M E N T.
12 14 18 6 13 17 14 8 12 14 5

WHAT IS THE BEST WAY TO RAISE CARROTS?

G R A B T H E T O P S A N D
2 13 7 16 5 9 12 5 17 1 10 7 14 3

P U L L !
1 11 15 15

Name ____________________

Read the Table of Contents

Table of Contents

Energy Sources, past and present
  Fossil Fuels 6
  Water, Sun and Wind 12

Future Energy Sources
  Nuclear 14
  Solar 19
  Tidal 22
  Geothermal 24
  Others 26

Who Needs Energy?
  Industry 34
  Agriculture 51
  Home Requirements 63

Conservation Methods for Everybody
  Protecting the Environment 80
  Changing Life Styles 94

Between what pages will you find information on the following subjects?

Subject	Between page ?	and page ?
1. Energy requirements of lumber and oil companies.	34	51
2. Present uses of oil, coal and natural gas.	6	12
3. How electricity is used in the home.	63	80
4. Problems with reactors and radioactive waste material storage.	14	19
5. Environmental laws to protect forests or wild rivers.	80	94
6. Methods of getting energy from sewage and solid waste.	26	34
7. Pioneer uses of windmills and waterwheels.	12	14
8. New ideas for housing and transportation.	94	-

Name ____________________

WHAT IS WATER?

Water is a combination of two colorless gases - two parts or atoms of hydrogen and one part or atom of oxygen. That makes the chemical formula of "H_2O".

"Hydro" is from a Greek word meaning water. Any English word having "hydro" or "hydra" in it has to do with water in some way.

Use your dictionary to find the meanings of the following words:

Hydrophobia: fear of water

Hydroplane: sea plane or boat with flat bottom that skims along the top of the water

Hydrant: fireplug

Hydroelectric: electricity produced from water power

Hydrography: measurement of lakes, rivers, etc.

Hydroponics: growing plants without soil, in water

Hydrotherapy: treatment of disease with water

Hydrosphere: water on the surface of the globe.

Name ____________________

DIRECTIONS: Unscramble the words in CAPITAL letters. Write your answers on the blank spaces.

1. Gardening without using pesticides is called CANIGOR.
O R G A N I C

2. R-value (resistance to heat-flow) is used in measuring the effectiveness of SUINTALOIN. I N S U L A T I O N

3. Decaying materials used by gardeners to enrich the soil is called STOPMOC. C O M P O S T

4. DUES items can often be recycled. U S E D

5. The best way to save our natural resources is to ERUES products.
R E U S E

6. We need energy to power our CHANIMSE. M A C H I N E S

7. You can save energy in your home by turning down the [illegible]RESTTTAM.
T H E R M O S T A T

Write the first letter of each word to find out:

"What did the little girl say to the dried up lake?"

"O - I - C - U - R - M - T"
1 2 3 4 5 6 7

Answers 526, 527, 528, 529

Name ______________________

DIRECTIONS: Draw one line under the complete subject.
Draw two lines under the complete predicate.

1. The total amount of water on the earth has not changed in the last 570 million years.
2. The water cycle is a continuous circle.
3. About 97% of all the earth's water is in the oceans.
4. Approximately 2% of the earth's water is locked in the polar ice caps.
5. Only 1% of the earth's water is fresh and available for human use.
6. The average person drinks about 145 gallons of water a year.
7. Man could not live more than five days without water.
8. Industry uses about 52% of our water in the United States.
9. Crop irrigation in the United States takes about 41% of our water.
10. The remaining 7% is used in homes, schools, and offices.
11. Our water is not as pure today.
12. Water pollution is a big problem for everyone.

Name ______________________

DIRECTIONS: Use the dictionary guide words to list the following words on the correct pages below. Remember to write the words in alphabetical order.

population
predator
petroleum
pesticide
pollution
phosphates
poison
power
parasite
plant

palm 423 plenty

perasite
pesticide
petroleum
phosphates
plant

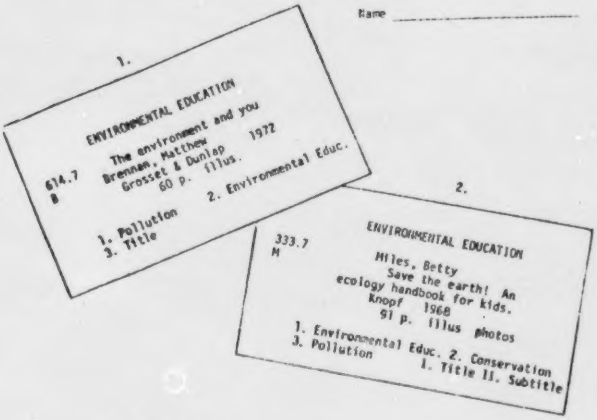
plump 425 prepare

poison
pollution
population
power
predator

Use the same words to complete the sentences.

1. Petroleum is another word for oil.
2. Air and water pollution are problems for our environment.
3. A predator is an animal that hunts other animals for food.
4. The number of people in a city is called the population.

Name ______________________



1.

ENVIRONMENTAL EDUCATION
614.7 The environment and you
B Brennan, Matthew 1972
Grosset & Dunlap
60 p. illus.

1. Pollution 2. Environmental Educ.
3. Title

2.

ENVIRONMENTAL EDUCATION
333.7
M
Miles, Betty
Save the earth! An
ecology handbook for kids.
Knopf 1968
91 p. illus photos

1. Environmental Educ. 2. Conservation
3. Pollution 1. Title II. Subtitle

Use the library cards to answer the following questions.

1. Who is the author of book 1? Matthew Brennan
2. What is the title of book 1? The Environment and You
3. When was book 1 published? 1972
4. What is the library call number of book 1? 614.7
5. What is the title of book 2? Save the Earth!
6. Who is the publisher of book 2? Knopf
7. What is the library call number of book 2? 333.7
8. Which book is illustrated with photographs? Save the Earth (2)
9. Which book has the most pages? Save the Earth (2)
10. Which book was most recently published? The Environment & You (1)

Name ______________________

DIRECTIONS: Read the story. Circle all the words which should begin with capital letters.

mr. dewitt hogle's 6th grade class at bubb school in mountain view succeeded in getting the desert tortoise designated the california state reptile. in 1972 the students, mr. hogle and parents worked very hard to get their assemblyman to introduce the bill and to push it through the state legislature. in addition to being successful with their project, the class learned about the legislative process firsthand.

the desert tortoise is fully protected by state law and is also the state reptile. this means that in california it is illegal to remove a tortoise from its natural home and that it is illegal to sell a tortoise. by law all captive desert tortoises in california must be registered with the california department of fish and game. application forms are available from the california department of fish and game, 1416 ninth st., sacramento, california, 95814.

Answers 530, 531, 532, 533

Name ______________________

DIRECTIONS: Solve these riddles by answering the questions correctly.

Riddle: WHAT THREE LETTERS MAKE EVERYTHING GO???

N If oil, coal, and natural gas are fossil fuels, put N. If not, put B.

R If America produces all the oil it needs, put O. If not, put R.

G If coal is the fossil fuel that we have the most of, put G. If not, put O.

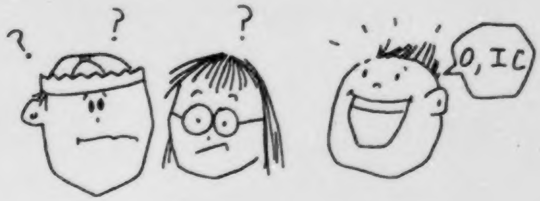
Riddle: WHAT CAN YOU SEE WHEN IT IS NOT SMOGGY IN LOS ANGELES???

U If natural gas causes less air pollution than burning coal or oil, put U. If not, put M.

C If forest fires are the largest source of air pollution, put O. If not, put C.

L If temperature can change air pollution levels, put L. If not, put P.

A If automobiles and factories create air pollution, put A. If not, put E.



Name ______________________

DIRECTIONS: Write statement or question in front of each sentence. Use the correct punctuation at the end of each sentence.

question Could you live without electricity ?

statement There would not be any electric lights .

statement We could use oil lamps or candles for lights .

question How would we cook our food ?

statement Long ago people used open fires or wood-burning stoves .

question Don't some people still use those today ?

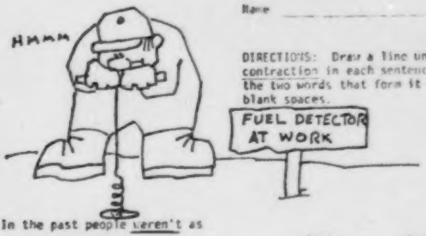
question What else would we have to do without ?

statement Some water heaters operate with electricity .

question How will I run my vacuum cleaner, refrigerator, hair dryer, or electric toothbrush without electricity ?

statement Life would surely be a lot different without electricity .

How many things can you think of that need electricity to work? Make a list. (You'll probably need to use the back of this paper too !)



Name ______________________

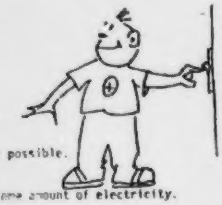
DIRECTIONS: Draw a line under the contraction in each sentence. Write the two words that form it on the blank spaces.

1. In the past people weren't as dependent on fossil fuels. were not
2. Today we've become dependent on machines to do our work. we have
3. If we use up our fossil fuels, we'll have to change the way we live. we will
4. There's a limit to the amount of fossil fuels in the ground. there is
5. It's important not to use more than you need. it is
6. Cars won't run without oil to make gasoline. will not
7. Some people couldn't heat their homes without coal or natural gas. could not
8. Without oil, we wouldn't have anything made of plastic. would not
9. What would you have to do without if you didn't have oil or natural gas? did not
10. We're going to have to find alternative energy sources. we are

---

Name ______________________

DIRECTIONS: Draw a line under the correct verb form to complete each sentence below.



Ways of Saving Energy with Lighting

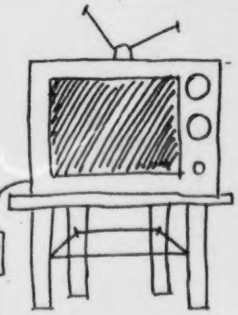
1. Turn off lights when you leave/leaving a room.
2. Fluorescent lights should be use/used whenever possible.
3. They give/gives four times the light for the same amount of electricity.
4. Fluorescent lights will also last/lasting ten times as long and produce less waste heat.
5. Dust/Dusts light bulbs often.
6. Dirt and dust absorb/absorbs light and waste energy.
7. Turning/Turn off all outdoor lights not necessary for safety or security.
8. Lampshades with white liners will reflect/reflects more light.
9. Don't leave/left unnecessary lights burning when gone at night.
10. Use/Using automatic timers which will turn different lights on for short periods of time and make the house look 'lived in'.
11. Remember, the wattage of a bulb does not measure/measures the amount of light it gives, but rather the electricity needed to light it.
12. Light is measured in lumens, which can be found/find on each bulb package.

Name ______________________

DIRECTIONS: Use these words to make compound words in the sentences below.

one ever washer

not ends time



1. Only run dish washer , clothes washer and dryer with full loads.
2. Wash clothes in warm or cold water when ever possible.
3. Every one should turn off TV sets and radios when they are not in use.
4. Self-cleaning ovens (due to high energy requirements) should be used only on week ends when other energy requirements are low.
5. Use appliences during the morning and night time hours when total energy uses are lower.
6. We can not afford to waste energy.

Write the compound words on the blank spaces.

dishwasher
weekends
whenever
nighttime
everyone
Cannot

538

Name ______________________

DIRECTIONS: Write the right homonym in each space.

1. If we (waist, waste) waste our natural resources, the supply will run out.
2. Fossil fuels will (not, knot) not last forever.
3. This is because (new, knew) new fossil fuels are not being made as fast as we are using them.
4. People are learning how to store solar energy (sew, so) so we can use it.
5. We (no, know) know that geothermal energy comes from underground steam.
6. Burning coal causes a (grate, great) great amount of air pollution.
7. Many people (see, sea) see nuclear energy as the power source of the future.
8. (Some, Sum) Some companies are burning garbage to provide energy.
9. Water flowing (threw, through) through dams creates hydro power.
10. The best (way, weigh) way to save energy is to use it wisely.

539

Name ______________________

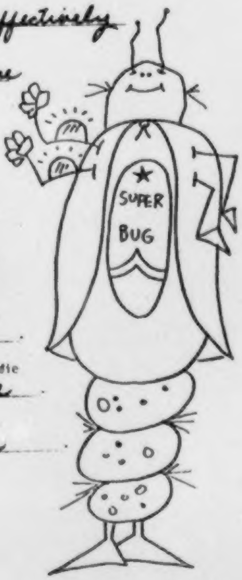
DIRECTIONS: Synonyms are words that have the same, or almost the same, meaning.

Use the words below to complete the sentences. Choose the word that has almost the same meaning as the word in parentheses ( ).

bothersome resistant affected survive

pesticide only applied effectively

1. Spraying poisons on pests works (well) effectively at first.
2. Most of the (troublesome) bothersome insects will die.
3. But a few will not be bothered by the (poison) pesticide .
4. They will live to make more insects that are also (immune) resistant to the poison.
5. When these new pests are sprayed, (just) only a few die.
6. Many of the insects, like their parents, are not (bothered) affected .
7. Every time the pests are sprayed, fewer die and more continue to (live) survive .
8. Soon the poison does not work at all, no matter how much is (used) applied .



540

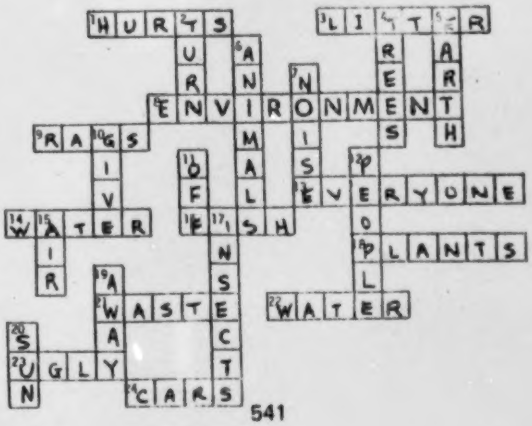
Name ______________________

Across

1. Every Litter Bit _____!
3. Trash where it doesn't belong, is called _____.
8. The _____ is what every living thing needs for life. (already filled in)
9. _____ are good to clean with. Save them.
13. _____ needs to help the ENVIRONMENT!
14. Each living thing must have _____ in its ENVIRONMENT.
16. Dirty water from factories kills many _____.
18. People, animals, and _____ live on Earth.
21,22. When you run the shower too long you _____ _____.
23. When something is not nice to look at, it is _____.
24. _____ put much poison into the air.

Down

2,11. When you leave a room, _____ _____ the lights.
4. Paper is made from _____.
5. Each living thing must have _____ in its ENVIRONMENT.
6. The ENVIRONMENTS of many _____ have been hurt by man.
7. _____ bothers people and hurts ears.
10,19. _____ _____ good, used items. Don't throw them away.
12. Too many _____ have hurt the ENVIRONMENT.
15. Each living thing must have _____ in its ENVIRONMENT.
17. Most birds eat _____.
20 The _____ provides light and heat.



541

Answers 538, 539, 540, 541

Name ____________________

These energy words are hidden in the sentences below. Find the words and draw a circle around them.

COAL SUN WIND HYDRO SEWAGE

WASTE SOLAR RESOURCE TIDAL AIR

EARTH OIL GAS HEAT WATER

1. There were two pairs of shoes under the bed.
2. Potatoes stay raw in dark places.
3. He got so large because he ate so much.
4. Mr. Jones was teaching as Miss Ewage was sick.
5. Sorry I'm late but I dallied at the disco all night.
6. Lime and lemon are sour centers in munchy drops of candy.
7. If you have two, I'll take one.
8. I like Arthur's SWAT eraser.

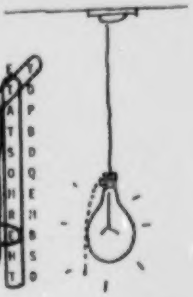
542

Name ____________________

DIRECTIONS: Draw a line under the best word to complete each sentence.
Circle those words in the 'word find' below.

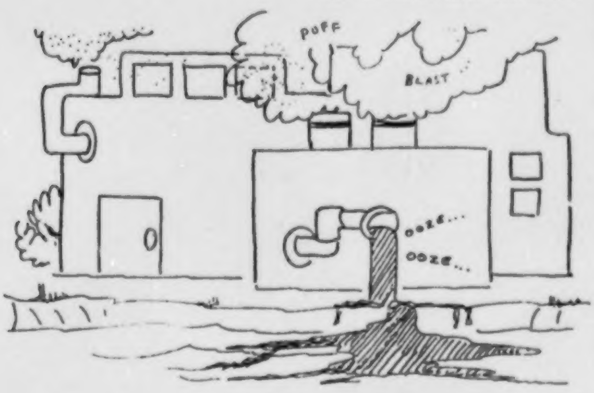
1. Cubic feet are used to measure water. / height.
2. Therms / Kilowatts tell you how much electricity a light bulb uses.
3. Insulation materials are rated by thickness / R value which measures resistance to heat flow.
4. Fluorescent light bulbs use less electricity / natural gas than incandescent bulbs.
5. You should turn off / on lights when you leave the room.
6. Closing the damper when the fireplace is not in use prevents house pets / heat from escaping up the chimney.
7. Leaky faucets waste / clean water.
8. Taking a long / quick shower instead of a bath uses less hot water.
9. Turning your blanket / thermostat down 10 degrees at night will save 10% in heating energy.
10. Saving energy / money will help to conserve our natural resources.

B	O	S	V	T	X	A	K	E	E	Y
M	P	A	A	Q	U	I	C	K	T	O
L	E	U	F	W	S	T	C	I	A	P
M	A	R	O	H	V	E	L	L	T	B
O	W	V	P	E	T	L	I	P	S	D
X	I	A	R	A	A	P	E	W	O	Q
M	O	L	L	T	D	E	Z	A	H	E
W	K	U	C	S	E	Y	S	T	R	M
F	R	T	T	A	W	A	S	T	E	B
J	L	A	A	B	Y	O	C	S	H	S
E	N	E	R	G	Y	W	X	I	T	O



543

Name ____________________


POFF
BLAST
OOZE...
OOZE...

Write the following words in alphabetical order.

pollutant toxic algae stagnation flume

erosion detergent waste phosphates biodegradable

1. algae
2. biodegradable
3. detergent
4. erosion
5. flume
6. phosphates
7. pollutant
8. stagnation
9. toxic
10. waste

544

Name ____________________

The students in Mr. Parks' class are learning about ecology. They know that when you go shopping you have the choice to buy products that will not cause pollution or waste. They have made a list of ideas to remind people how to be ecology-wise shoppers.

Help them get the list ready for printing by finding and correcting the twenty spelling errors.

Shopping
Reminders for Shoping

Cause
1. Avoid buying paper plates or cups that coz unneccessary waste
unnecessary
2. Buy drinks in returnible bottels.
returnable bottles
laundry detergents
3. Buy laundrie deturgents that are low in phosphates. Try to find one that is labled biodegradeble.
labeled biodegradable extra
4. Don't buy products that have exter
packaging
packageing. Try to choose those that come
containers
in contaners that can be used again.
Avoid unless
5. Avoide plastic bags unles you can use them
Plastic biodegradable
at home. Plastuc is not biodagradable.
tissue
6. Buy bathroom tissu that is white. The color
dyes
dies can pollute our water.
shopping
7. Save shoping bags from the store to be used
again
agen.

545

Answers 542, 543, 544, 545

Name ______________________

This is a letter to the Audubon Society from Ima Bird. Since he did not go to school, he needs some help in using the right pronouns. Correct the letter by changing the pronouns to the proper forms.

Dear Audubon people,

I have heard that you help birds. ~~Us~~ We birds are getting sick because the people who live near ~~we~~ us are spraying pesticides around to kill the insects. ~~Us~~ We eat these insects and then ~~us~~ we get sick too.

Also, there is this factory that keeps dumping its waste into the bay. This makes the water dirty and ~~us~~ we get sick from drinking that too.

The air pollution isn't helping ~~we~~ us much either. ~~Me~~ My friend, Henry Hawk, can't fly right anymore because the pollutants make the air too heavy and ~~she~~ he can't glide through that thick air.

Lastly, the people are now filling in the marsh land where ~~us~~ we live with more dirt so ~~them~~ they can build more houses.

I need ~~our~~ your help.

Hopefully,

Ima Bird

The National Audubon Society has been working to protect our environment for many years. They know a lot about birds and how they live. You can write to them and ask about birds where you live. Their address is:

National Audubon Society
950 Third Ave.
New York, New York, 10007

Name ______________________

DIRECTIONS: On the line at the right of each sentence write the adjective that describes the underlined noun.

1. Rushing water can be used to generate electricity. rushing
2. Geothermal energy comes from underground steam. underground
3. The wind, sun and water are continuous sources of energy. continuous
4. There is a limited supply of fossil fuels. limited
5. Some people think there are unacceptable risks connected with nuclear energy. unacceptable
6. Trapped water from rising tides can be used to create tidal energy. rising
7. Energy can even be produced from rotting garbage. rotting
8. Careful thought must be given to how we use our energy sources. careful

Write an adjective in the blank space for each sentence.

9. Burning coal as fuel can result in ______________ air.
10. The ______________ sun is the source of solar energy.
11. We are looking for ______________ ways to provide energy.
12. Wise use of our energy sources will make a ______________ world.

Name ______________________

DIRECTIONS: Adverbs tell how, when, or where about a verb.

In the sentences below:
Draw one line under the verb,
Draw two lines under the adverb, and
Write HOW, WHEN, or WHERE the adverb describes the verb.

Carole's family is trying to save energy. Here are some of the things they did to conserve energy and our natural resources.

1. First, they put insulation in the attic and walls. when
2. The parents drove slowly to save gasoline. how
3. Carole rode her bike often. when
4. They wisely used solar heating for their swimming pool. how
5. Carole's dad carefully fixed all the leaky faucets. how
6. The family always took short showers. when
7. They turned the thermostat lower. where
8. Sometimes they recycled bottles and cans. when
9. Everyone closed doors quickly to save heat. how
10. The family worked hard to save energy. how

JUST RIGHT!
3FT
4FT
5

Name ______________________

People are becoming concerned about pollution. They are trying to do things that will make our environment cleaner and a better place for all living things.

Here are some ways we are helping our environment. Put yes in front of the ones that will help. Put NO in front of the ones that are foolish and unreal.

yes Young trees are being planted as old trees are cut down.
no Polluted air is being trapped and put into balloons. These balloons will be sent to Mars.
yes Litter laws remind people to keep their environment clean.
yes Scientists are working to find new ways to kill insects. They are looking for ways which won't harm birds and other animals.
no Students are planting toothpicks in the school yard. This will help to save our trees.
yes There are places where wild animals are protected. There are laws to protect other animals.
yes Engineers are working to design car motors that won't poison the air.
yes Many people are riding buses or bicycles. That means fewer cars on the streets.
no Farmers are planning to grow tomatoes on the moon where there are no insects.
no All families are raising polar bears in their backyards. This will help them to become less endangered.
yes More and more factories are taking the poisons from their smoke and cleaning their used water.
no Scientists are planning to send rocketships to the sun to collect solar energy.
yes City planners are working to beautify the cities. They are also trying to save open spaces for parks.
yes Many people recycle or reuse things they buy. This helps get rid of trash and waste.
no People are saving gasoline by driving backwards.

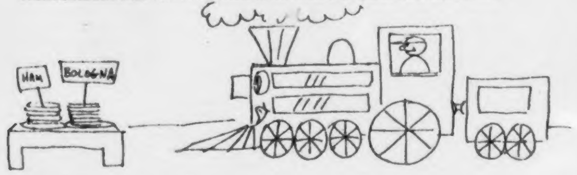
Answers 546, 547, 548, 549

Name

Coal, oil and natural gas are fossil fuels. They are the three sources of energy most used in our society today.

DIRECTIONS: Do the problems. Use your answers to solve the riddle.

362 + 415 777 A	843 + 126 969 P	331 + 426 757 Y	806 + 121 927 B
463 + 431 894 C	271 + 608 879 T	540 + 319 859 L	162 + 332 494 S
728 + 170 898 R	341 + 456 797 O	846 + 120 966 W	128 + 441 569 U



WHAT DO STEAM ENGINES EAT?

C	O	A	L		C	U	T	S!
894	797	777	859		894	569	879	494

Name

James has made a chart to show how much water is needed for different purposes. It is confusing because James used different kinds of measurements. Use the following equivalents to change all the amounts into gallons.

4 quarts = 1 gallon
8 pints = 1 gallon
16 cups = 1 gallon

USES OF WATER

It takes this much water to:

run a dishwasher (per load)	100 quarts	25 gallons
take a shower	40 to 80 pints per minute	5 to 10 gallons per minute
fill a bathtub	480 cups	30 gallons
run a washing machine (per load)	320 pints	40 gallons
flush the toilet	12 to 20 quarts	3 to 5 gallons
grow a pound of potatoes	60 gallons	60 gallons
make one Sunday paper	2,400 cups	150 gallons

Name

Jim is planning to start an organic garden. This means that he will not be using poisons to kill insects or any chemicals as fertilizers. He will only be using natural materials in his garden.

DIRECTIONS: Help him to add the costs of the things he is planning to buy. Add each list and then add the total cost.

Handyman Lumber Store

1.	Wood (for fencing)	$ 8.12
2.	Wire (for compost bin)	4.14
3.	Nails - 2 pounds	.62
4.	Sand (to loosen soil)	3.15
	Total	$16.03

Green Thumb Nursery

1.	Six tomato plants	$ 1.20
2.	Carrot seeds	.39
3.	Onion sets	.79
4.	Lettuce plants	.90
5.	Marigolds (to get rid of slugs)	1.35
	Total	$4.63

Variety Store

1.	String	$ .39
2.	Watering hose	7.59
3.	Garden gloves	1.98
	Total	$9.96

Sam's Pet Store

1.	Earthworms (to loosen soil)	$ 1.17
2.	Ladybugs (to get rid of aphids)	1.09
	Total	$2.26

Total Amount Needed

Handyman Lumber Store	$16.03
Green Thumb Nursery	$ 4.63
Variety Store	$ 9.96
Sam's Pet Store	$ 2.26
Total	$32.88

What did the big flower say to the little flower?

Name

The following problems are examples of people who are saving energy, natural resources, and money too.

DIRECTIONS: Read how much they saved and write the amount in standard numerals.

1. Howard put insulation in his attic. In just one month, he saved twenty-two dollars, five dimes and three pennies on his heating bill.

   How much money did Howard save? $22.53

2. The Parks family turned their thermostat down to 65 degrees. Last month they saved three dollars, two quarters and one nickel.

   How much money did the Parks family save? $3.55

3. Mrs. Smith is keeping her drapes open in the daytime to allow the sun's heat in and closing them at night to keep the cold out. So far she has saved one dollar, one quarter, two dimes and two pennies.

   How much money has Mrs. Smith saved? $1.47

4. Bob fixed the leaky faucet in the kitchen. This month his water bill was one dollar, six dimes, one nickel and three pennies less.

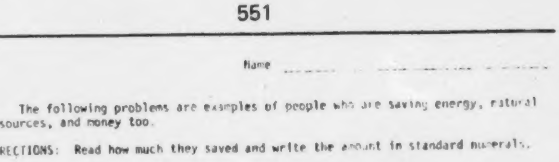
   How much has Bob saved? $1.68

5. Everyone in the Jones family is saving electricity by turning out lights, watching less TV, and using fewer electrical appliances. They have saved seven dollars, one nickel and one penny in the first three months.

   How much has the Jones family saved? $7.06

6. Marilyn is hanging her clothes outside on a clothesline to dry instead of using the clothes dryer. She has saved two dollars and four pennies since May.

   How much money has Marilyn saved? $2.04



Name ______________________

Read the problem. **Do the work.**

1. Mrs. Smith uses her washing machine 6 times a week. Last week she used a total of 192 gallons of water to do her wash. How much water does she use each time she uses her washing machine?

$6\overline{)192}$ 32 gallons

2. Sally has five people in her family. Each person takes a bath every night. They use a total of 150 gallons of water. How much water is used for each bath?

$5\overline{)150}$ 30 gallons

3. Mary has 5 people in her family, too. They each take a shower every night. They use a total of 100 gallons of water for their showers. How much water is used for each shower?

$5\overline{)100}$ 20 gallons

4. Mrs. Jones uses 5 gallons of water for cooking one meal. She cooks 30 meals every week. How much water does she use for cooking each week?

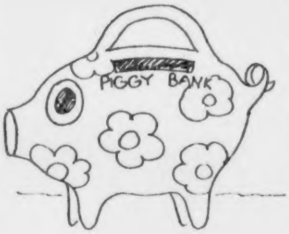
30
5
150 gallons

5. A family of four persons uses about 280 gallons of water every day. How much water is this for each person?

$4\overline{)280}$ 70 gallons

Which uses less water?

☒ Taking a shower.
☐ Taking a bath.



Name ______________________

DIRECTIONS: Use the information from the table to work out the problems.

Major Electric Appliances

Appliance	Average Monthly Cost
Clothes Washer	$ .38
Clothes Dryer	3.66
Dishwasher	1.26
Freezer, frost free	6.17
Range	4.12
Refrigerator	6.30
Television, black & white	.65
Television, color	1.85

1. How much does it cost to operate a frost free freezer for 3 months?

$ 6.17
3
$ 18.51

2. How much does it cost to operate a refrigerator for 6 months?

$ 6.30
6
$ 37.80

3. How much does it cost to operate the dishwasher for 9 months?

$ 1.26
9
$ 11.34

4. How much does it cost to use a black and white television set for one year?

$ .65
12
130
65
$ 7.80

5. How much does it cost to use a color television set for one year?

1.85
12
370
185
$ 22.20

6. How much does it cost to use a clothes washer and dryer for one year?

$ .38
3.66
$ 4.04

$ 4.04
12
808
404
$ 48.48

Name ______________________

Mary is planning a garden for her backyard. She is going to grow her own vegetables. She is planning to buy starter plants from the nursery. Help her figure out how many plants to buy.

The garden will be 10 feet wide and 10 feet long.

She is going to plant one row of each vegetable.

1. The small corn seedlings need to be planted 6 inches apart. How many corn plants should she buy to fill one row?

12"
10'
120"

$6\overline{)120}$ 20 corn plants

2. The artichoke plants need 3 feet for each plant. How many artichoke plants should she buy?

$3\overline{)10}$ 3 artichoke plants

3. The tomatoes need to be planted 12 inches apart. How many tomato plants will fit in one row?

$12\overline{)120}$ 10 tomato plants

4. Radishes are planted 4 inches apart. How many radish plants will be in one row?

$4\overline{)120}$ 30 radish plants

5. She also wants a row of green onions. They need to be spaced 3 inches apart. How many onion plants should she buy?

$3\overline{)120}$ 40 green onion plants

6. String beans need more room. They should be placed 24 inches apart. How many bean plants can she buy?

$24\overline{)120}$ 5 bean plants

7. Parsley is planted 10 inches apart. How many parsley plants will fit in one row?

$10\overline{)120}$ 12 parsley plants

8. Is there any room left in the garden? If so, how much space is left?

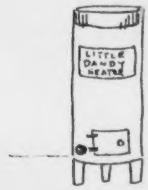
About 2 Seet

Name ______________________

DIRECTIONS: One cubic foot of water is equal to about 7.5 gallons.
Multiply by 7.5 to find how many gallons of water are contained in the following:

Water Heater

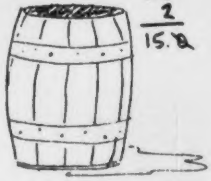
4 cubic feet



7.5
4
30.0

Rain Barrel

2 cubic feet

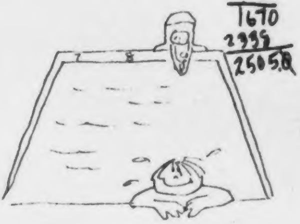


7.5
2
15.0

Swimming Pool

334 cubic feet

334
7.5
1670
2338
2505.0



Lake

18,342 cubic feet

18342
7.5
91710
[illegible]
[illegible]

Answers 554, 555, 556, 557

Name ______________________

DIRECTIONS: Read the problems. Multiply to change the cubic foot measurements to gallons.

Water is usually measured by cubic feet.

One cubic foot is equal to 7.5 gallons.

1. A dishwasher uses three cubic feet of water. How many gallons is that?

$$\begin{array}{r} 7.5 \\ \times\ 3 \\ \hline 22.5 \end{array}$$

2. A washing machine can use five cubic feet of water for each clothes load. How many gallons is that?

$$\begin{array}{r} 7.5 \\ 5 \\ \hline 37.5 \end{array}$$

3. If it takes one cubic foot of water each time you flush the toilet, how many gallons are you using?

7.5

4. Mr. Smith uses eight cubic feet of water every day for his garden. How many gallons is he using each day?

$$\begin{array}{r} 7.5 \\ 8 \\ \hline 60.0 \end{array}$$

5. A tub bath can use up to four cubic feet of water. How many gallons is that?

$$\begin{array}{r} 7.5 \\ 4 \\ \hline 30.0 \end{array}$$

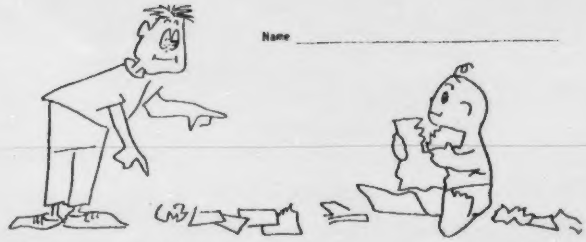
6. A shower uses about one cubic foot of water per minute. If you stay in the shower for six minutes, how many gallons of water are you using?

$$\begin{array}{r} 7.5 \\ 6 \\ \hline 45.0 \end{array}$$

- People say that taking a shower uses less water than taking a tub bath. How can that be?

It has to be a short shower - about 3 minutes

Name ______________________



Y	O	U	A	R	E	A
$1\frac{1}{3}$	$\frac{9}{10}$	$1\frac{1}{5}$	$1\frac{2}{7}$	1	$1\frac{1}{2}$	$1\frac{2}{7}$

L	I	T	T	E	R	M	O	N	S	T	E	R!
$\frac{1}{2}$	$\frac{1}{3}$	2	2	$1\frac{1}{2}$	1	$1\frac{3}{4}$	$\frac{9}{10}$	$1\frac{3}{8}$	$\frac{7}{8}$	2	$1\frac{1}{2}$	1

Add these fractions to find out what the boy said to his baby brother.

E $\frac{3}{4} + \frac{3}{4}$ $1\frac{1}{2}$	S $\frac{2}{8} + \frac{5}{8}$ $\frac{7}{8}$	Y $\frac{2}{3} + \frac{2}{3}$ $1\frac{1}{3}$	U $\frac{4}{5} + \frac{2}{5}$ $1\frac{1}{5}$
I $\frac{1}{6} + \frac{1}{6}$ $\frac{1}{3}$	R $\frac{4}{6} + \frac{2}{6}$ 1	L $\frac{1}{12} + \frac{5}{12}$ $\frac{1}{2}$	A $\frac{6}{7} + \frac{3}{7}$ $1\frac{2}{7}$
N $\frac{5}{8} + \frac{6}{8}$ $1\frac{3}{8}$	M $\frac{7}{8} + \frac{7}{8}$ $1\frac{3}{4}$	T $\frac{2}{2} + \frac{2}{2}$ 2	O $\frac{6}{10} + \frac{3}{10}$ $\frac{9}{10}$

Name ______________________

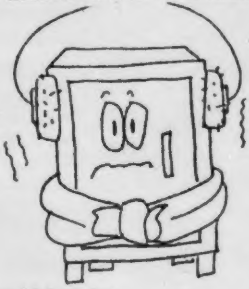
Saving Electricity Makes Cents . . . .

This is an energy chart from the PG & E (Pacific Gas and Electric Company) which shows how many kilowatts (kwh) it takes to use these electric appliances.

Using the 1/1/78 rate of 4.8¢ per kwh, figure our how much it costs to operate these appliances. Put a check mark in front of the ones you use in your home.

Appliance	Estimated Use	Energy Cost
Coffee Maker	¼ kwh per pot	1.2¢ per pot
Deep fryer	1 kwh per hour	4.8¢ per hour
Frying pan	½ kwh per hour	2.4¢ per hour
Micro wave oven, 5 minutes	1/10 kwh per use	.5¢ per use
Oven, self cleaning	6 kwh per clean	28.8¢ per clean
Range	1 kwh per meal	4.8¢ per meal
Refrigerator, frostless	5 kwh per day	24¢ per day
Refrigerator, manual	2 kwh per day	9.6¢ per day
Toaster (2 slice)	1/20 kwh per use	.24¢ per use
Waffle Iron (3 to 4 servings)	1/3 kwh per use	1.6¢ per use
Clothes dryer	3 kwh per load	14.4¢ per load
Washing machine	6 kwh per load	28.8¢ per load
Steam iron	1/3 kwh per hour	1.6¢ per hour
Water heater	13 kwh per day	62.4¢ per day
Waterbed heater	4 kwh per night	19.2¢ per night

Name ______________________



Today many people have food freezers in their homes. They are used to store foods at a low temperature to prevent them from spoiling.

There are two types of food freezers. One is called 'frostless' or 'frost-free' which means that it automatically defrosts (removes the frost and ice). The other is called a manual defrost which means you need to turn it off and remove the frost and ice by hand.

Use the chart below to find out how much it costs for electricity to operate both kinds of freezers.

One kilowatt (kwh) costs $ .05.
A frostless freezer (15 cu. ft.) uses 5 kwh per day.
A manual defrost freezer (15 cu. ft.) uses 3 kwh per day.

How much does it cost to operate a frostless freezer for:

One day = $.25
One month (30 days) = $7.50
One year (365 days) = $91.25

How much does it cost to operate a manual defrost freezer for :

One day = $.15
One month (30 days) = $4.50
One year (365 days) = $54.75

Which one costs less to operate? the manual defrost freezer

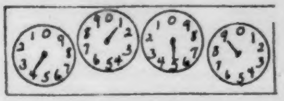
How much less:

Per day $.10
Per month $3.00
Per year $36.50

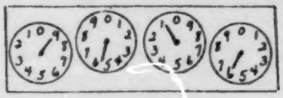
Answers 558, 559, 560, 561

Name ______________________

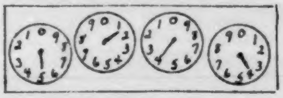
"Read" the following meters. Be sure to write your answers as kilowatt hours (Kwh).



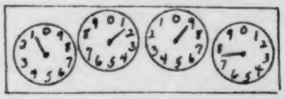
4159



9506



5144



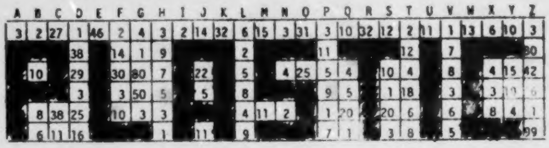
1197

Name ______________________

Materials that decompose or break up quickly are called biodegradable. These materials decay rapidly and become part of the soil.

Materials that are not biodegradable are bad for our environment because they cause long lasting piles of trash. It takes thousands of years for some of these materials to decompose.

Follow the directions for each column to find the name of a material that is not biodegradable.



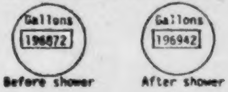
In column A blacken in all the squares containing even numbers.
In column B blacken in all the squares containing odd numbers.
In column C blacken in all the squares containing numbers evenly divisible by five.
In column D blacken in all the squares containing numbers more than forty.
In column E blacken in all the squares containing numbers less than thirty.
In column F blacken in the square that is equal to V.
In column G blacken in the square that is equal to X.
In column H blacken in all the squares with numbers evenly divisible by two.
In column I blacken in all squares with numbers between four and fourteen.
In column J blacken in all the squares with numbers evenly divisible by three.
In column K blacken in all the squares with numbers between twenty and thirty.
In column L blacken in all the squares with numbers more than ten.
In column M blacken in all the squares with numbers evenly divisible by four.
In column N blacken in all the squares with numbers above five.
In column O blacken in all the squares with numbers less than twenty.
In column P blacken in all the squares with even numbers.
In column Q blacken in the square with the number that is equal to 3 X 5.
In column R blacken in all the squares with numbers under XX.
In column S blacken in the square with the number that is equal to 4 X 6.
In column T blacken in all the squares with odd numbers.
In column U blacken in all the squares containing one digit numbers.
In column V blacken in all the squares containing two digit numbers.
In column W blacken in all the squares with numbers evenly divisible by five.
In column X blacken in all the squares with numbers over eleven.
In column Y blacken in all the squares with numbers evenly divisible by six.
In column Z give your pencil a rest and do not blacken in any numbers.

Name ______________________

Most water meters record gallons just as a car's odometer records mileage. However, some water meters show the usage in cubic feet. For these, you must multiply by 7.5 (the approximate number of gallons in one cubic foot) to find how many gallons are used.

DIRECTIONS: Use the meter readings below to find out how much water is being used. Be sure to label your answers as gallons or cubic feet.

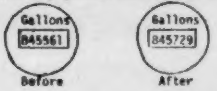
1. How much water is used in taking a shower?



Before shower After shower

196942
− 196872
70 gallons

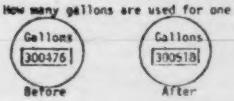
2. How many gallons were used to wash the car?



Before After

845729
845561
168 gallons

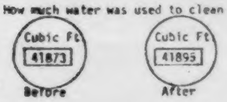
3. How many gallons are used for one load of wash in the washing machine?



Before After

300518
300476
42 gallons

4. How much water was used to clean the sidewalk with the hose?



Before After

41895
41873
22 Cu. Ft.

7.5
22
150
150
165.0 gallons

How many gallons of water is that? (Remember to multiply by 7.5)

Tips to save water

1. Take shorter showers.
2. When washing the car, use a bucket for soapy water and use the hose to rinse
3. Be sure to wash full loads when using the washing machine.
4. Use a rake or broom to clean the sidewalk, not the hose.

Name ______________________

Leaky faucets can waste a lot of water. To find out if you have a leak, turn everything off carefully so that no water is being used anywhere in the house. Then check the position of the water meter dial for about fifteen minutes. If it hasn't moved, you know that your house is leak free. But if it has, start checking to find that leak.

DIRECTIONS: Find out how much water can be wasted by changing pints to quarts and quarts to gallons.

Remember: 2 pints = 1 quart 4 quarts = 1 gallon

A slow leaking faucet can waste up to 5 pints of water in one hour.

1. How many pints of water are wasted in four hours?

5 pts.
× 4
20 pts.

2. How many quarts are wasted in eight hours? How many gallons is that?

5 pts.
× 8
40 pts

2 ⟌40 = 20 qts.

4 ⟌20 = 5 gals.

3. How many gallons of water are wasted in 24 hours (one day)?

5 pts.
24
20
10
120 pts

2 ⟌120 = 60 qts.

4 ⟌60 = 15 gals.

4. How many gallons of water are wasted in one month (30 days)?

15
30
450 gallons

Answers 563, 564, 565, 566

Name ______________________

DIRECTIONS: Answer the questions by changing the Roman numerals to standard numbers.

I = 1
V = 5
X = 10
L = 50

C = 100
D = 500
M = 1000

1. In 1970 each American used an average of DLIII pounds of paper.
How many pounds of paper did each American use? 553 ounds

2. Each person also used approximately CXCVIII board feet of lumber.
How many board feet of lumber did each person use? 198 board feet

3. Americans spent more than XXXIX billion dollars for wood products.
How much money was spent on wood products? 39 Billion dollars

4. There are more than 10,000 sawmills and CCC pulp mills in the United States.
How many pulp mills are there in our Country? 300 pulp mills

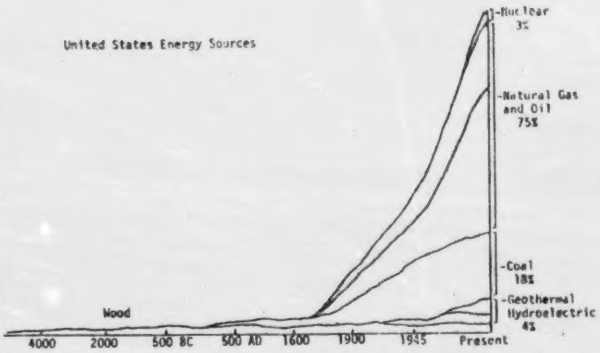
5. There are also more than DCCC paper mills in the United States.
How many paper mills are there? 800 paper mills

6. Paper board mills can roll out newsprint at XX miles an hour.
How fast can the paper board mills make newsprint? 20 m.p.h.

7. The average Sunday newspaper has about CXXVIII pages.
How many pages does the average Sunday newspaper have? 128 pages

8. The Sunday newspaper requires over CXL acres of pulp wood for the circulation of one edition.
How many acres of pulp wood is needed to make the Sunday newspaper?
140 acres of pulpwood

Name ______________________



DIRECTIONS: Use the graph to answer the questions.

1. What energy source has been used for the longest period of time?
Wood

2. When the first settlers arrived in America in 1620, what sources of energy did they have?
Wood and coal

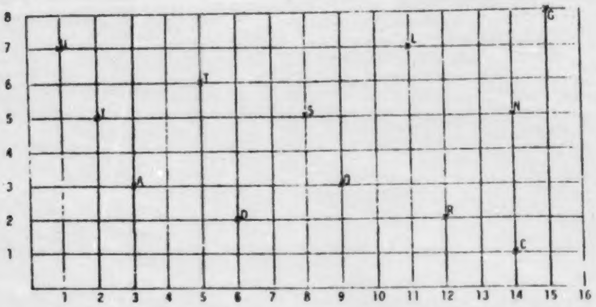
3. At the present time, what are our largest sources of energy?
Natural gas and oil

4. Which source of energy has most recently been developed?
Nuclear

5. What percentage of our energy comes from geothermal and hydroelectric sources?
9%

Name ______________________

Fuel is matter that is burned to get energy.



Count over and up, carefully follow the rules.......
and you'll write down the names of the three fossil fuels.

→ over	up ↑	
9	3	O
2	5	I
11	7	L

,

→ over	up ↑	
3	3	A
14	5	N
6	2	D

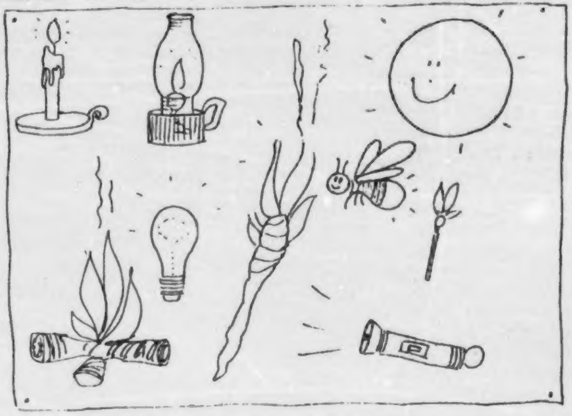
→ over	up ↑	
14	5	N
3	3	A
5	6	T
1	7	U
12	2	R
3	3	A
11	7	L

→ over	up ↑	
15	8	G
3	3	A
8	5	S

14	1	C
9	3	O
3	3	A
11	7	L

Name ______________________

DIRECTIONS: Use the pictures to answer the questions.



1. Which things were used for light by the earliest people?
sun, Torches, campfires, fireflies

2. Which things do you use for light?
sun, flashlight, lightbulb, candles, matches
lanterns

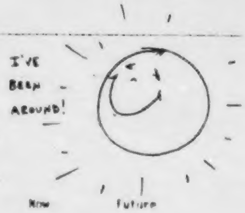
3. Which thing will last the longest?
sun

4. Which source of light is a living thing?
firefly

5. Which thing needs electricity to produce light?
light bulb

Name

People have used the earth's natural resources to provide energy for a long time.


I'VE BEEN AROUND!

DIRECTIONS: Put an X in the boxes to show when people used, use, or may use the following resources for energy.

RESOURCE	More than 200 years ago	Now	Future
Wood	X	X	X
Hydro (water)	X	X	X
Wind	X	X	X
Geothermal		X	X
Solar (sun)	X	X	X
Nuclear		X	X
Tidal		X	X
Oil		X	
Coal		X	X
Natural gas		X	

Three of these energy sources, the sun, wind, and water cannot be used up. Some others, like wood, are renewable. By using wood carefully and replanting trees, we can continue the supply. The fossil fuels, coal, oil, and natural gas are in limited supply and we are in danger of running out of these widely used energy sources. Why are the fossil fuels not renewable?

Name

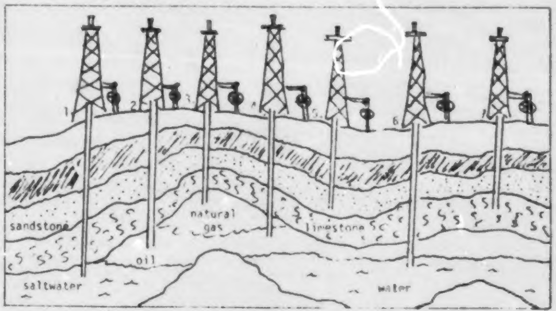
Fossil Fuels

Fossil fuels began forming in the earth many millions of years ago. This was a time when the earth was covered by many warm, shallow oceans and only dinosaurs and other prehistoric plants and animals lived. As these plants and animals died, they sank to the ocean floors and decayed into sludge. These layers of sludge were quickl covered by mud. As the weight of the water and mud pressed down on the sludge, it began to change into the fossil fuels which we call coal, oil and natural gas.

This whole process took millions of years. During this period of time, the surface of the earth was constantly changing, creating mountains, deep oceans and other land forms. The mud layers became different types of rock, and pools were form which trapped the oil and natural gas.

Today, some fossil fuel deposits are found near the earth's surface while other are buried deep under the ground. Scientists are constantly looking for new places to drill for oil and natural gas. It often costs millions of dollars to drill for oil and there is only one chance in nine that oil will be found.

DIRECTIONS: Look at the diagram below. Tell what you would expect to find from drilling each well.



Well No. 1 saltwater No. 2 oil No. 3 natural gas

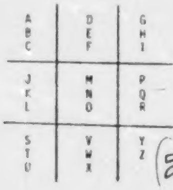
No. 4 oil No. 5 sandotone No. 6 water

No. 7 limestone

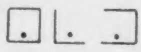
Why don't we drill wells to find coal?

Name

DIRECTIONS: Use this code to answer the questions. Look at the shapes and positions of the letters.
For example: A-

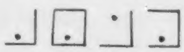


The fossil fuel used to make gasoline is



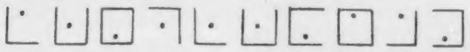
O I L

The fossil fuel we have the most of is



C O A L

Energy that is created by underground steam and heat, like volcanoes and geysers, is called



G E O T H E R M A L

Name

Other Uses of Oil

Oil is more than an energy source. Petroleum provides many things besides gas and oil to run our cars and heat our homes. Petroleum is a mixture of many chemicals that can be used to make useful products.

Here are just a few of the other "petro" products.

Farm Products	Household Products	Other Products
fertilizers	plastic wrap	glasses
rust preventers	plastic dishes	records
pesticides	styrofoam	medicines
weed killers	pipes and hoses	nylon and other man mad materials

We have only used petroleum products during the last 100 years or so. What did people use before oil was discovered?

DIRECTIONS: Write what people might have used or done before oil was discovered to replace the things or products listed below.

Products We Use Now	What People Used Before Oil
1. Plastic sandwich bags	1. cloth napkins, waxed paper
2. Weed killers	2. hand weeding
3. Plastic dishes	3. clay dishes
4. Nylon and polyester fabrics	4. cotton, wool, other natural fiber
5. Phonograph records	5. tin or metal records
6. Plastic pipes	6. metal pipes, open trenches
7. Fertilizers	7. manure, composted materials

Answers 571, 572, 574, 575

Name ______________________

Energy from the Ocean

Many people are trying to use the power of the oceans to provide energy. Scientists are exploring ways to use ocean tides, waves, and even water temperature differences to create electricity.

So far, there are three main ways of getting energy from the ocean waters.

Tidal Energy - Low dams are built to trap the ocean waters as the tides rise. When the tide rises, the water is trapped behind the dam. As the tide recedes, the water flows through the dam turning turbines to make electricity.

Ocean Thermal Energy - This energy is created by using the different temperatures of the ocean waters. Solar energy warms the surface water of the oceans. The difference in temperature between the surface water and the deeper water is a source of heat energy. It can be used to run a steam engine.

Wave Energy - The power of the ocean waves create this type of energy. Power stations are built in the ocean near shorelines. As the wave approaches the power station, the water is caused to spiral into a central pipe or core. The swirling water then turns a turbine which makes electricity.

DIRECTIONS: Write the correct name for each type of ocean energy.

Wave energy Harnesses the power of the ocean waves.

Tidal energy Relies on changes in the ocean tides.

Ocean thermal energy Uses temperature differences in ocean waters.

Try this ...

To make a "wave machine" -

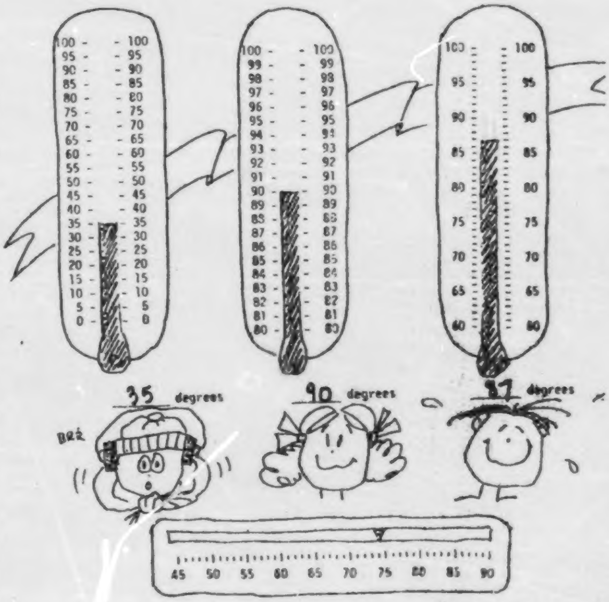
Use a tall jar. Fill it half way with water, then add mineral oil or cooking oil to the top of the jar. Add some blue food coloring or blueing. Cover the jar and presto - your very own wave machine!

Name ______________________

We get heat and light from the sun. Many people think that this natural resource can provide much of our energy in the future. It is called solar energy.

We measure the heat that comes to the earth with a thermometer.

DIRECTIONS: Write the temperatures according to each thermometer below.

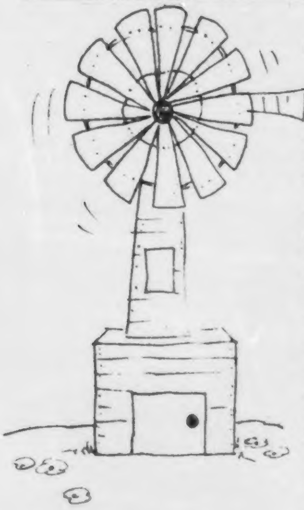


35 degrees

90 degrees

87 degrees

74 degrees



Name ______________________

Wind Power

Many people believe that the wind is a good source of power to meet our energy needs. The wind is free, cannot be used up, and does not add pollution to our environment.

For many years, windmills have been used to harness the power of the wind. Today, many windmills are providing electricity for houses, restaurants, TV stations, and other businesses. At Downey Amusement Park near Allentown, Pa., the largest windmill in the country supplies all the electricity for the park's roller coaster.

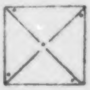
Although the wind can be an effective source of energy, it is limited to areas where the wind blows at least ten miles per hour on the average. People who live on the East or West coasts usually have this much wind. Windmills are expensive to build but they can provide free electricity with very little maintenance.

DIRECTIONS: Write the three reasons why the wind is a good source of energy.

1. It is free
2. Cannot be used up
3. It is non-palluting to the environment

Try this . . . . Use this paper to make your own portable windmill.

1. Cut this paper on the dotted line.
2. Fold the square into four triangles.
3. Cut on fold lines to ½ inch from center.
4. Stick a pin through every other corner, through center, and secure to pencil eraser. Blow.



Name ______________________

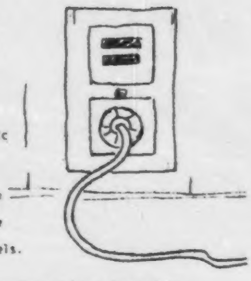
ELECTRICITY

We use electricity everyday for light, heat, and power. Where does this electricity come from?

Electricity is made by man by moving large magnets around each other. These huge magnets are parts of machines we call generators or turbines. But, electricity is not a natural resource. It takes some kind of energy to start the generators or turbines moving.

If this energy comes from water power, such as waterfalls or water stored behind dams, we call the electricity that is made hydroelectric power.

Some generators are moved by steam power. Water is heated by burning fossil fuels - oil or coal - or in nuclear power plants by splitting uranium atoms to produce heat. The steam rushes through pipes and turns the generators to produce the electricity. About 90% of the electricity generated today is produced by burning fossil fuels.



DIRECTIONS: Write the names of four natural resources which can be used to generate electricity.

water oil

coal uranium

Try this . . .

Make a chart to show how much electricity you use in one day. Use these headings.

USE	PURPOSE
(Example: Electric can opener	Open dog food can)

After one day, see how many of these uses you could do without and still have a comfortable life.

Answers 576, 577, 578, 579

Name ______________________________

How Electricity Affects Our Lives

People began using electricity less than 100 years ago. Thomas Edison made the first practical electric light bulb in 1879. The electric motor was little used until the 1380s.

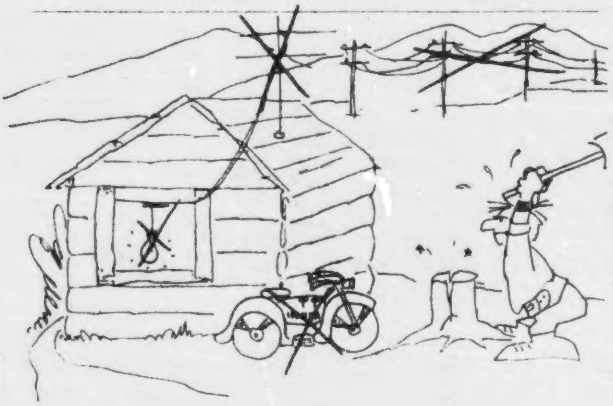
Today we have many electric appliances that help us around the house, entertain us, and make our lives easier. In 1900 very few homes had electricity. Those that did used it mainly for lighting. People cleaned their homes with brooms, mops, and dust cloths. They bought ice every few days to keep their food cold and fresh.

People in the United States today own many electric appliances, from big refrigerators and washing machines to small electric razors and can openers. Over 100,000,000 appliances a year are manufactured in the United States alone.

How does this affect our environment? Where do the materials come from to make the appliances? Where does the electricity to run the appliances come from?

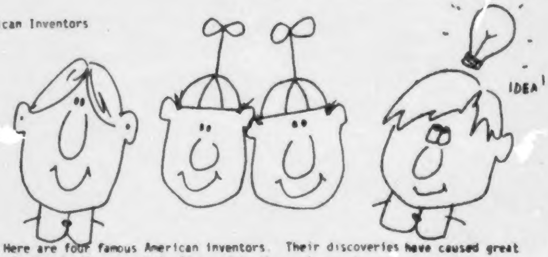
DIRECTIONS: In the picture below, cross out the things that are wrong.

A PIONEER CABIN IN 1850



Name ______________________________

American Inventors



Here are four famous American inventors. Their discoveries have caused great changes in the way people live and in the environment.

DIRECTIONS: After each person, write the name of his invention. Answer the questions

Henry Ford automobile

How did this benefit people? They were able to go to places which were far away. It gave them greater mobility.

What effect has it had on our environment? It is one of the main causes of air pollution & it uses our natural resources.

Wilbur and Orville Wright airplane

How did this benefit people? They were able to go to places which were very far away in a shorter time.

What effect has it had on our environment? Causes pollution & uses up our natural resources.

Thomas A. Edison light bulb (also phonograph, battery, etc) many electrical inventions

How did this change the way people live? Made electric lighting practical & available to people.

What effect has it had on our environment? People use more & more electrical appliances which means using more energy to run them. This uses up our natural resources.

Name ______________________________

Here are four Americans who made great contributions to our environment.

DIRECTIONS: Write the correct name under each picture.

John Chapman George Washington Carver Luther Burbank John Muir

1864-1943

George Washington Carver

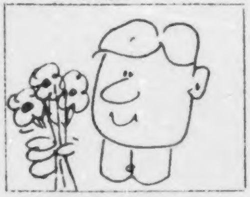
American educator and botanist. Found hundreds of uses for peanuts and sweet potatoes. Invented peanut butter.

1775-1847

John Chapman

American nature lover and folk hero. Well known for kindness to animals and love for apple trees. Nicknamed Johnny Appleseed.

1894-1926



Luther Burbank

American plant breeder. Discovered many new varieties of plants and found ways to improve them.

1838-1914

John Muir

American naturalist and explorer. Promoted the establishment of natural parks in the United States.

Name ______________________________

DIRECTIONS: Thomas Edison and Benjamin Franklin were two great American inventors. Read the story. Fill in the clue words to read the quotations.

Thomas Alva Edison probably invented more things than any other man in history. His most famous invention was the $\underset{10}{I}\ \underset{4}{N}\ \underset{16}{C}\ \underset{7}{A}\ \underset{4}{N}\ \underset{17}{D}\ \underset{11}{E}\ \underset{18}{S}\ \underset{16}{C}\ \underset{11}{E}\ \underset{4}{N}\ \underset{13}{T}$ $\underset{12}{L}\ \underset{10}{I}\ \underset{5}{G}\ \underset{2}{H}\ \underset{13}{T}$ $\underset{14}{B}\ \underset{15}{U}\ \underset{12}{L}\ \underset{14}{B}$. He also invented the record player. Another word for record player is $\underset{1}{P}\ \underset{2}{H}\ \underset{3}{O}\ \underset{4}{N}\ \underset{3}{O}\ \underset{5}{G}\ \underset{6}{R}\ \underset{7}{A}\ \underset{1}{P}\ \underset{2}{H}$. Other inventions include the mimeograph machine and the $\underset{8}{M}\ \underset{3}{O}\ \underset{9}{V}\ \underset{10}{I}\ \underset{11}{E}$ projector.

Thomas Edison said, "$\underset{5}{G}\ \underset{11}{E}\ \underset{4}{N}\ \underset{10}{I}\ \underset{15}{U}\ \underset{18}{S}$ $\underset{10}{I}\ \underset{18}{S}$ $\underset{3}{O}\ \underset{4}{N}\ \underset{11}{E}$ $\underset{1}{P}\ \underset{11}{E}\ \underset{6}{R}$ $\underset{16}{C}\ \underset{11}{E}\ \underset{4}{N}\ \underset{13}{T}$ $\underset{10}{I}\ \underset{4}{N}\ \underset{18}{S}\ \underset{1}{P}\ \underset{10}{I}\ \underset{6}{R}\ \underset{7}{A}\ \underset{13}{T}\ \underset{10}{I}\ \underset{3}{O}\ \underset{4}{N}$ $\underset{7}{A}\ \underset{4}{N}\ \underset{17}{D}$ 99 $\underset{1}{P}\ \underset{11}{E}\ \underset{6}{R}$ $\underset{16}{C}\ \underset{11}{E}\ \underset{4}{N}\ \underset{13}{T}$ $\underset{1}{P}\ \underset{11}{E}\ \underset{6}{R}\ \underset{18}{S}\ \underset{1}{P}\ \underset{10}{I}\ \underset{6}{R}\ \underset{7}{A}\ \underset{13}{T}\ \underset{10}{I}\ \underset{3}{O}\ \underset{4}{N}$."

Benjamin Franklin was energy conscious 200 years before the expression was invented. He discovered the lightning $\underset{6}{R}\ \underset{3}{O}\ \underset{17}{D}$. He also invented a free standing stove to burn $\underset{19}{W}\ \underset{3}{O}\ \underset{3}{O}\ \underset{17}{D}$ which is still used today. Other inventions include the rocking chair, bifocal glasses and $\underset{17}{D}\ \underset{7}{A}\ \underset{20}{Y}\ \underset{12}{L}\ \underset{10}{I}\ \underset{5}{G}\ \underset{2}{H}\ \underset{13}{T}$ saving time.

Benjamin Franklin said, "$\underset{3}{O}\ \underset{4}{N}\ \underset{11}{E}$ $\underset{13}{T}\ \underset{3}{O}\ \underset{17}{D}\ \underset{7}{A}\ \underset{20}{Y}$ $\underset{10}{I}\ \underset{18}{S}$ $\underset{19}{W}\ \underset{3}{O}\ \underset{6}{R}\ \underset{13}{T}\ \underset{2}{H}$ $\underset{13}{T}\ \underset{19}{W}\ \underset{3}{O}$ $\underset{13}{T}\ \underset{3}{O}\ \underset{8}{M}\ \underset{3}{O}\ \underset{6}{R}\ \underset{6}{R}\ \underset{3}{O}\ \underset{19}{W}\ \underset{18}{S}$."

638

Name

Have you ever wondered where the names "Mother Earth" or "Mother Nature" came from?

These names came from the fact that everything comes from the earth, or soil, and, sooner or later, everything returns to the earth.

We know that dead plants and animals decay or decompose and become part of the soil. Other materials rot or decompose and become part of the soil, too. Bacteria helps this process which enriches the soil. This decomposition is nature's way of recycling.

Some materials decompose easily. These things or materials are called biodegradable. Dead plants and animals, food waste, and most paper is biodegradable. But, some materials take a long, long time to decompose. Plastic, glass, and metals are examples of materials that do not decompose easily. They are not biodegradable. When things made out of plastic, glass, or metal are thrown away, it takes a long time for them to decompose. These materials can make mountains of trash.

HURRY UP
COMPOST POT

DIRECTIONS: People can help to get rid of the growing piles of trash and materials that are not biodegradable.

Write the first letter of the underlined words in the story. Y C E R E C L

Unscramble the letters to find a way to get rid of materials that do not decompose easily.

RECYCLE

Try this . . .

You'll need:
large clay flower pot
top soil
plastic wrap
pebbles
small pieces of litter (paper, plastic, metal, broken glass, food scraps, etc.)

First, cover the hole in the bottom of the pot with the pebbles. Fill about 1/3 with top soil. Add a layer of the collected litter. Cover the litter with another layer of top soil.

Then, sprinkle with water. Cover the pot with plastic wrap and set it in a warm, dark place. Keep the soil moist.

After two or three weeks, dump the contents onto a newspaper. Which materials have started to decompose? Which have not?

Put it all back in the pot and repeat the above. Check again in another two weeks.

584

QUESTIONS:

1. Who wants whiter, cleaner clothes?

PEOPLE IN AMERICA

2. Why are detergents harmful to the rivers and lakes?

THEY ARE NOT BIODEGRADABLE. THE BACTERIA CANNOT BREAK THEM DOWN AND THE RIVERS AND LAKES BECOME COVERED WITH SOAPSUDS.

3. How do phosphates hurt fish?

THEY ADD MORE PHOSPHATE TO THE WATER WHICH ACTS LIKE A FERTILIZER FOR THE ALGAE AND OTHER WATER PLANTS. THESE PLANTS AND ALGAE USE UP THE OXYGEN IN THE WATER AND THE FISH DIE.

4. What can you do to stop this kind of water pollution?

YOU MUST BE CAREFUL OF THE KINDS OF CLEANERS YOU USE.

585

Name

Minerals

Minerals are an important natural resource. Almost everything we use is made from some type of mineral.

Everyone knows that we are running out of fossil fuel minerals, such as oil and and natural gas, but we are running out of other minerals too. Minerals are natural resources which cannot be replaced or renewed. Our country already uses more minerals than we have. We must buy over half the aluminum, nickel, tin, and zinc we need from other nations.

Some people think the answer is to find more. But, all minerals come out of the ground. How to get the minerals without destroying large parts of our wildlife habitats is a big problem. Some land areas have been ruined by mans' efforts to get coal by strip mining or by hydraulic mining to find gold and silver.

The best answer seems to be to use what minerals we have wisely. Many minerals such as aluminum and iron, can be recycled and used again. Recycling can conserve our natural resources and, at the same time, also helps to get rid of our growing piles of trash.

Follow the directions to answer the riddle.

On space:	Is this object made from minerals?	If yes, put:	If no, put:
1.	Car	T	A
2.	Refrigerator	W	R
3.	Milk	A	E
4.	Nail Polish	N	D
5.	Airplane	T	O
6.	Cotton sock	P	Y
7.	Pencil	F	E
8.	Roller skate	O	T
9.	Plant	G	U
10.	Frying pan	R	A
11.	Plastic dish	C	M
12.	Door key	E	O
13.	Paper	P	N
14.	Soda pop can	T	S
15.	Coin	S	V

RIDDLE: What is the difference between a copper penny and a silver quarter?

TWENTY FOUR CENTS
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

586

Name

Pesticides and Poisons

People have changed the environment through the use of pesticides and poisons. Poisons, such as DDT, have been used to kill flies, mosquitoes, termites, ants and other harmful insects. Farmers can increase their crop production up to six times by using pesticides. This is important because there are many people in the world today who do not have enough food.

Now people have discovered that these poisons last a long time. They do not disappear. Birds die from eating insects whose bodies contain these poisons. Traces of DDT are now found in almost all human bodies, too.

Some people think the answer is organic gardening. Organic gardeners do not use pesticides or poisons. They try to control harmful insects by using natural materials such as soap sprays, sand and ashes, and water. They also make use of good insects, like spiders, ladybugs, and praying mantis, which eat the harmful ones. They even remove the insects by hand. Although this is better for the environment, the amount of food produced is less.

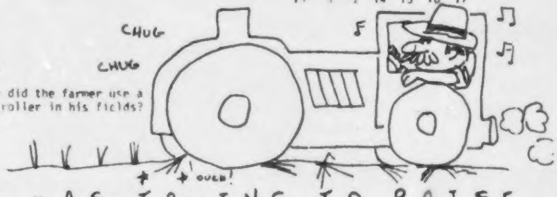
The problem of growing enough food for everyone without using pesticides has not yet been solved.

DIRECTIONS: Fill in the blanks to solve the riddle.

1. Gardening that uses only natural materials is called ORGANIC.
2. Another word for insect poison is PESTICIDE.
3. Insects that cause disease or eat crops are HARMFUL.

RIDDLE

Why did the farmer use a steam roller in his fields?



HE WAS TRYING TO RAISE MASHED POTATOES

587

Name ______________________

What's Happening to our Wildlife?

The destruction of wildlife is one way man has changed the environment.

Many animals have been killed by people. Millions of predators, such as foxes, coyotes, wolves, mountain lions, hawks, and owls, have been killed to 'protect' ranch and farm animals. Today, as a result, many crops are threatened by rats, mice, and other rodents. We have upset the balance of nature.

Over the past years, many other animals were killed for sport. The buffalo, also known as the American bison, almost became extinct. In 1870 there were over fifty million buffalo in the United States but in 1889 only 551 could be found. Early train passengers used the buffalo for target practice by shooting them from the windows of the moving trains. Now the buffalo is protected by law and it is estimated that there will be over a half million by the year 2000.

Other animals are killed for fur or food. The passenger pigeon was killed for food until it became extinct. Many fur bearing animals are on the endangered animal list because of over trapping and hunting.

But, the biggest problem facing wildlife today is the loss of their habitats. Our growing population needs more land to build houses, factories, and highways. We have drained swamps and filled in baylands to make room for more buildings and roads. What happens to the animals that lived there?

Even animals that have not lost their habitats and are not sought after for food, fur, or sport are in danger. The increasing water and air pollution and the wide use of pesticides and poisons are other problems for wildlife.

We must learn to share the earth will all living things or our own survival may be in danger.

William F. Cody was nicknamed "Buffalo Bill". Use the code to find out why.

DIRECTIONS: Change each letter or numeral to the one that comes before.
Example: SJHIU = RIGHT

IF LJMMFE 5,972 CVGGBMP JO POF TFBTPO.

HE KILLED 4861 BUFFALO IN ONE SEASON

Do you think he would have been proud of this today?

Name ______________________

DIRECTIONS: Fill in as many boxes in each category as you can. Be sure the words you write in begin with S, T, R, O, N, and G.

CATEGORIES

	WILDLIFE	ENERGY SOURCE	POLLUTION PROBLEM
S	sea otter, snake Southern bald eagle seal, shark 1	Sun- solar shale 1	smog Sewage 1
T	toucan timber wolf 1	tidal 5	trash toxic wastes 2
R	rhinoceros Rocky mountain bighorn sheep 2	3	rubbish refineries 3
O	orangutan owl octopus ostrich opossum 3	oil 2	oil spills 3
N	narwhale nene newt nuthatch 5	nuclear 1	noise 5
G	gorilla giraffe 2	geothermal 3	garbage 2

Add up the points for all the boxes in which you wrote answers.

What was your total? Maximum number of points is 65.

Remember we all have to work together to keep our environment STRONG and healthy.

CONSERVATION FOR CHILDREN
Criterion Referenced Test (5)

Name ______________________

Date ______________________

DIRECTIONS: Read the questions. Write your answers on the blank spaces.

1. Name two kinds of energy that were used in the past, are used now, and may be used in the future.

More than 100 years ago	Now	Future
1. *(wind, coal, solar,*	1. *(geothermal, solar,*	1. *(wind, water, solar,*
2. *water)*	2. *fossil fuels, nuclear, water, tidal)*	2. *nuclear, tidal, fusion)*

2. Two reasons why we should save energy are:

   1. *(For future generations, not be dependent on foreign sources, save our*
   2. *natural resources, save money.)*

3. What are three sources of energy that cannot be used up?

   1. *(sun)* 2. *(wind)* 3. *(water)*

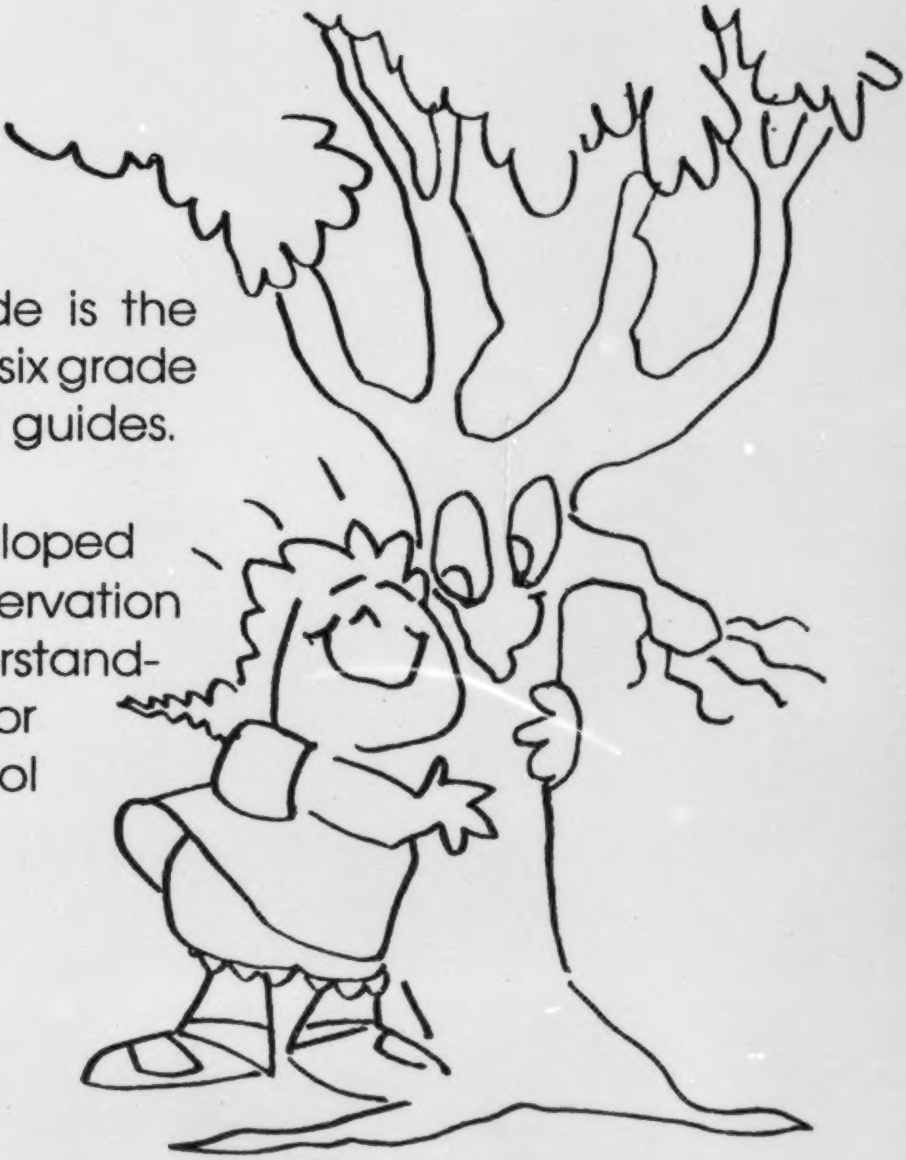
4. List four ways of saving energy in the home.

   1. *(Turn off electric appliances, TV, Radio, Stereo, etc. when not in use.)*
   2. *(Turn off lights when leaving the room, use fluorescent bulbs, smaller wattage.)*
   3. *(Hang clothes outside to dry; take shorter showers; run dishwasher and clothes*
   4. *washers only with full loads; keep drapes closed to keep heat in or out, set thermostats higher (lower); etc.)*

APPENDIX B

Level 6

Conservation For Children



This activity guide is the sixth in a series of six grade level sequenced guides.

It has been developed to promote conservation awareness, understanding and action for elementary school children,

© Cupt. Sch. District 1980

An ESEA Title IV-C Project, Number 6298

Produced by Cupertino Union School District
John Muir Elementary School
6560 Hanover Drive
San Jose, CA 95129

(408) 252-5265

Carl W. Krause, Superintendent

Board of Education

Robert D. Hall, President

Severene Bylin

Roger C. Halstead

Valerie Harrison

Claire Hobbs

PROJECT STAFF

State Consultant: William A. Johnson

Associate Superintendent: William Zachmeier

Project Administrator, Principal: Rex Wetzel

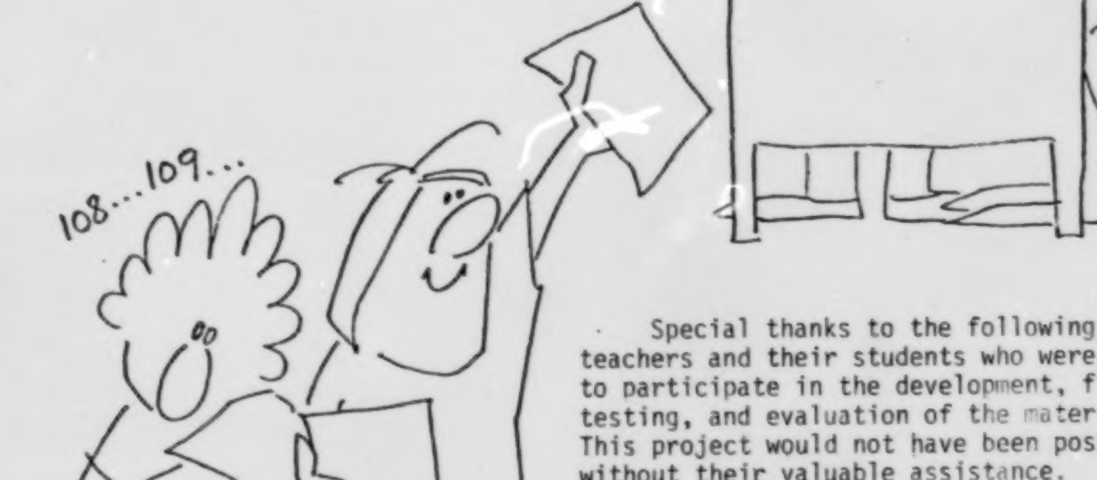
Director: Marilyn Bodourian

Program Clerks: Carole Kumaishi
Alice Ruick

Illustrator: Gen McKenzie

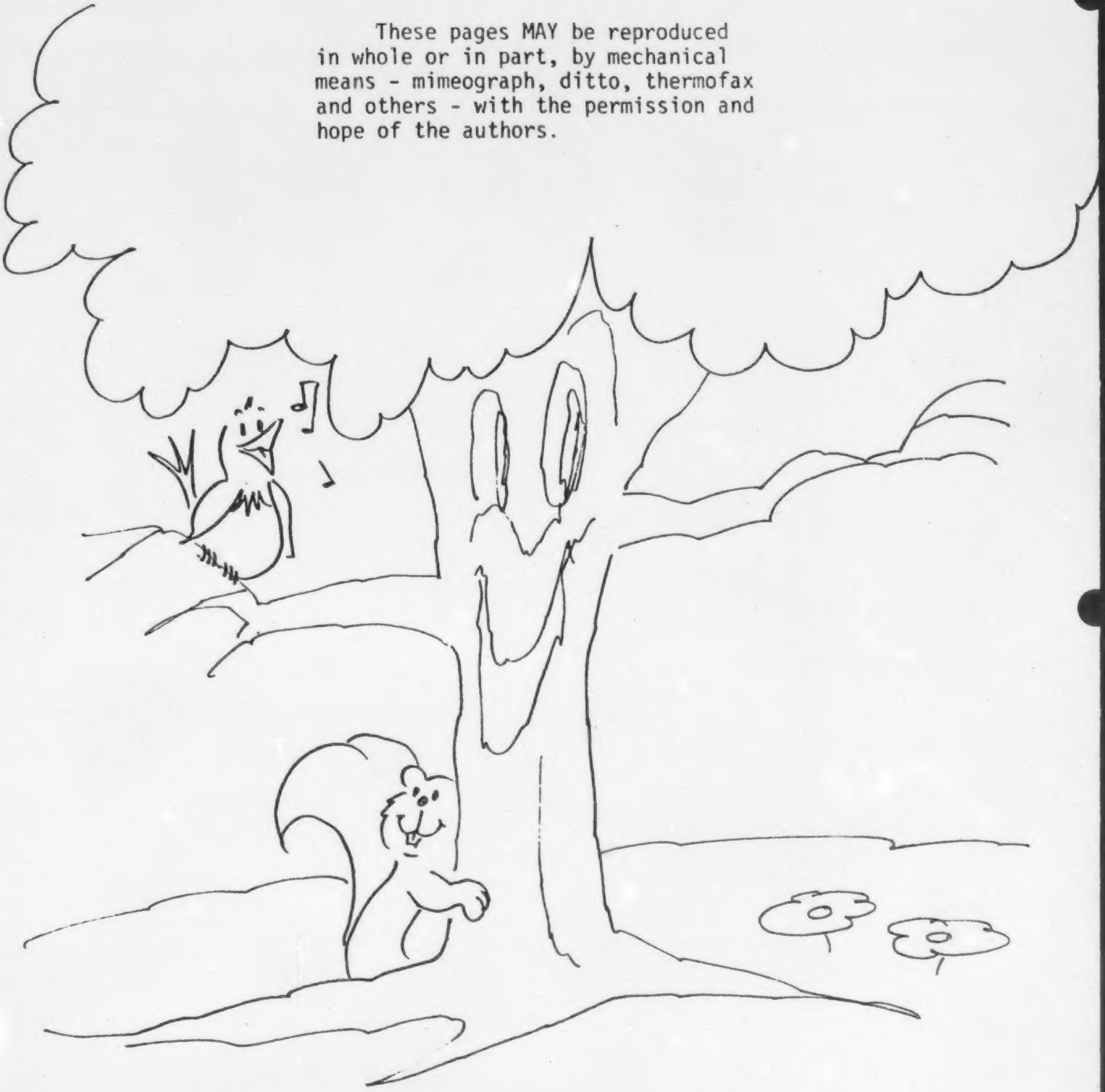
Evaluators: Lynn Fossum
Eloise Martin Appel

Consultants: Environmental Volunteers
Jane Hall



Special thanks to the following project teachers and their students who were willing to participate in the development, field testing, and evaluation of the materials. This project would not have been possible without their valuable assistance.

Carlton Parks
Karen Walton
Jeri Bryden
John McNaughton



These pages MAY be reproduced in whole or in part, by mechanical means - mimeograph, ditto, thermofax and others - with the permission and hope of the authors.

The pages in this book are printed on 100% recycled paper.

TABLE OF CONTENTS

PART 1

Introduction
Purpose, contents, how to use the materials 600

Conservation Concepts 602

Criterion Referenced Test 603

Test-Worksheet Correlation 605

Content Guide 606

PART 2

Student Worksheets

Language Arts 610

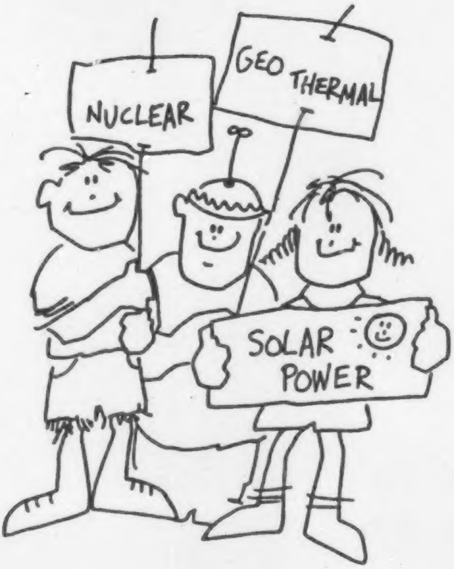
Mathematics 650

Social Studies, Science 670

Related Activities 690

APPENDIX

Answers
Student Worksheets
Criterion Referenced Test



INTRODUCTION

PURPOSE:

The CONSERVATION FOR CHILDREN materials were developed to enable teachers to provide relevant conservation information for students in an easy and practical manner.

As our natural resources decline, both in quality and quantity, the importance of conservation education cannot be understated. As children become aware of environmental problems, they can better understand the precedents and consequences of such and their interdependency with the environment. This knowledge will hopefully lead to positive action.

CONTENTS:

Each grade level guide includes:

1. Conservation Concepts -
   These grade level concepts have been determined by teachers to meet the basic interests of students and to correlate with other grade level subject matter.

2. Criterion Referenced Test -
   A student test designed to measure pre and post knowledge of the grade level conservation concepts.

3. Class Record Sheet -
   A recording sheet for teacher use in programming instruction. This page also correlates the test items and student worksheets.

4. Content Guide -
   The guide correlates accepted basic skill objectives and conservation topics. The listing of student worksheets includes

forty pages of language arts activities, twenty pages of mathematics, twenty pages of social studies and science, and ten pages of related activities.

5. Student Worksheets -

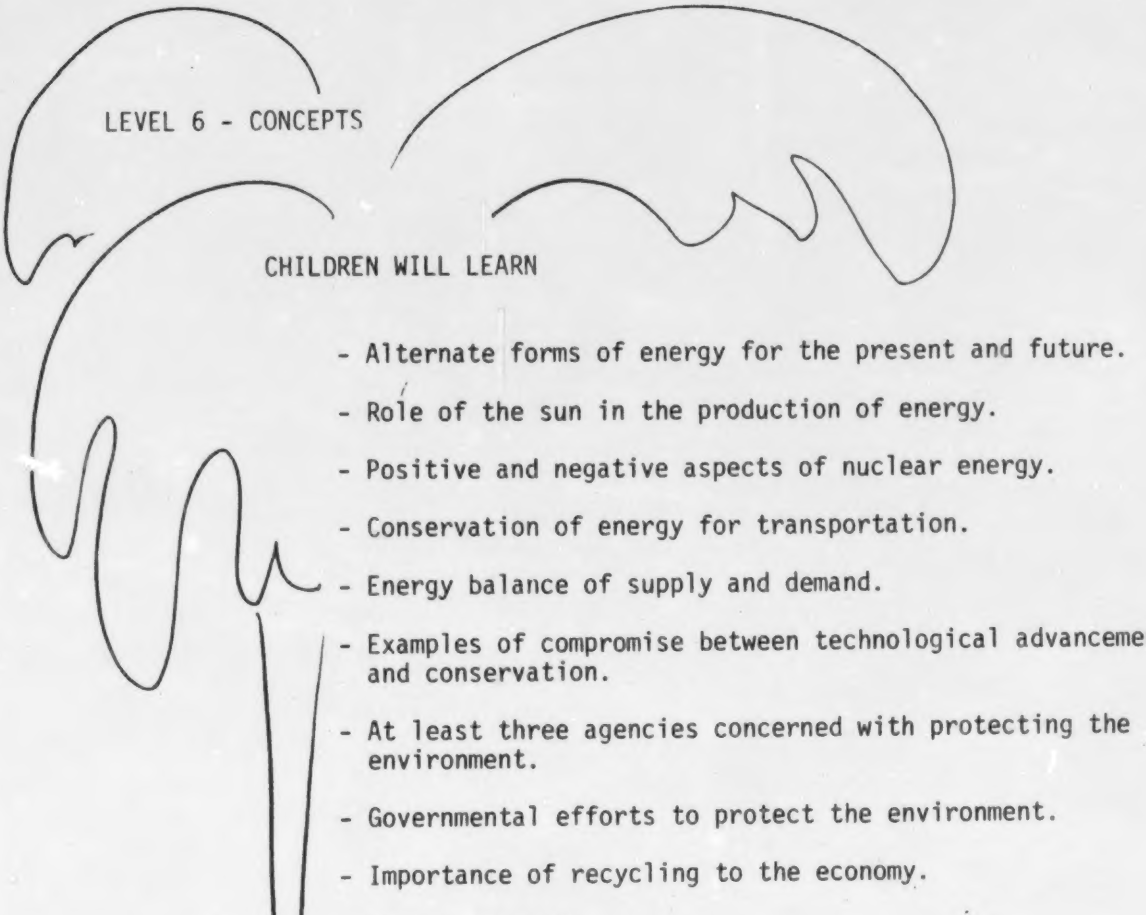
   Ninety worksheets which integrate basic skills objectives and conservation information. The worksheet pages were planned and developed by students and teachers and are intended for duplication. They are readily usable in the classroom and require no additional materials, time or space. These worksheets were designed to be relevant, motivating and fun for children.

USING THE MATERIALS:

The CONSERVATION FOR CHILDREN materials may be used as a primary resource for teaching basic skills, as supplementary materials to a core program, as enrichment activities, skill review, or as a unit of study.

The worksheets have purposefully not been sequenced or arranged in any order, other than subject area, to encourage teachers to pick and choose those that will meet the needs of their students. Teachers may use the Content Guide to identify basic skills and/or conservation topics for each worksheet. Conservation concepts are covered in each basic skill area and are presented in several worksheets with varying degrees of difficulty. Each worksheet is independent of the others.

The criterion referenced test is included for teachers who want to assess student growth in conservation knowledge. Recording pretest results on the class record sheet will enable teachers to program the materials to meet individual and group needs.

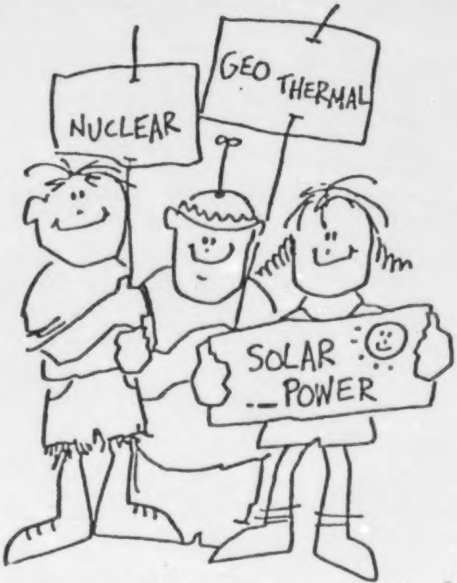


LEVEL 6 - CONCEPTS

CHILDREN WILL LEARN

- Alternate forms of energy for the present and future.
- Role of the sun in the production of energy.
- Positive and negative aspects of nuclear energy.
- Conservation of energy for transportation.
- Energy balance of supply and demand.
- Examples of compromise between technological advancement and conservation.
- At least three agencies concerned with protecting the environment.
- Governmental efforts to protect the environment.
- Importance of recycling to the economy.
- The meaning of:

  Population
  Exhaust
  Tidal
  Solar
  Nuclear
  Hydroelectric
  Geothermal
  Compromise
  Reactor
  Fusion
  Fission
  Contamination
  Radiation
  Technology
  Alternative



CONSERVATION FOR CHILDREN
Criterion Referenced Test (6)

Name ____________________________

Date ____________________________

DIRECTIONS: Read the questions. Write your answers on the spaces provided.

1. List seven possible energy sources for the future which do not depend on fossil fuels.

   1. ____________________
   2. ____________________
   3. ____________________
   4. ____________________
   5. ____________________
   6. ____________________
   7. ____________________

2. Write the names of three organizations that are concerned with protecting the environment.

   1. ____________________________
   2. ____________________________
   3. ____________________________

3. The three main reasons for recycling materials are:

   1. ____________________________
   2. ____________________________
   3. ____________________________

4. Explain what is meant by the 'energy balance' of supply and demand.

   ____

   ____

5. Four effects of population growth on the environment are:

   1. ____
   2. ____
   3. ____
   4. ____

6. Name three things that governments have done to protect the environment.

   1. ____
   2. ____
   3. ____

7. What are three good things about using nuclear power?

   1. ______________________________
   2. ______________________________
   3. ______________________________

8. What are three dangers in using nuclear power?

   1. ______________________________
   2. ______________________________
   3. ______________________________

9. Complete the sentences.

   1. Twenty five percent of all the energy used in the United States is used for ______________________.
   2. The largest source of air pollution in California is ______________.
   3. The original source of energy is ______________.

10. List five ways we could save energy in regard to transportation.

    1. ______________________________
    2. ______________________________
    3. ______________________________
    4. ______________________________
    5. ______________________________

CONSERVATION FOR CHILDREN

Class Record Sheet
Criterion Referenced Test - Grade 6

Question #	No. right on Pre-test	No. right on Post-test	Student Worksheets
1. List seven possible energy sources for the future which do not depend on fossil fuels.			620, 624, 629, 637 646, 649, 652, 670 671, 672, 673
2. Write the names of three organizations that are concerned with protecting the environment.			633, 647, 664, 688
3. The three main reasons for recycling materials are:			610, 656, 657, 664 685
4. Explain what is meant by the 'energy balance' of supply and demand.			648, 674, 675
5. Four effects of population growth on the environment are:			621, 622, 623, 644 649, 662, 663, 677 679, 680, 681
6. Name three things that governments have done to protect the environment.			614, 643, 655, 667 686
7. What are three good things about using nuclear power?			611, 672
8. What are three dangers in using nuclear power?			611, 618, 654
9. Complete the sentences. 1. Twenty five percent of all the energy used in the United States is used for ____________.			626, 627, 661, 665 684
2. The largest source of air pollution in California is ______.			630, 634, 638, 659 665
3. The original source of energy is __________.			646, 670, 671
10. List five ways we could save energy in regard to transportation.			612, 615, 626, 627 636, 638, 642, 658 660, 665, 666, 682 684

Page No.	Skill	Conservation Topic	District Curriculum
Language Arts			
610	Literal comprehension	Recycling	
611	Literal comprehension	Nuclear energy	
612	Literal comprehension	Transportation, bicycles	
613	Interpretive comprehension	Economics of conservation	
614	Literal comprehension	Environmental license plates	
615	Inappropriate sentences	Future transportation	
616	Outlines, topic headings	Energy sources	
617	Literal comprehension	Dams	
618	Main idea	Nuclear energy	
619	Literal comprehension	Radiation	
620	Literal comprehension	Wind	
621	Tenses	Population problems	
622	Writing limericks	Endangered animals	
623	Simple subject, predicate	Population problems	
624	Sentences, complete, inc.	Tidal energy	
625	Categorizing	Vocabulary	
626	Word definitions, acrostic	Transportation	
627	Outlines, topic phrase	Transportation	
628	Spelling	Transportation	
629	Spelling	Solar energy	
630	Table of Contents, usage	Pollution	
631	Dictionary guide words	Vocabulary	
632	Library cards	Endangered animals	

Page No.	Skill	Conservation Topic	District Curriculum
633	Capitalization	Environmental agencies	
634	Following directions	Transportation	
635	Conjunctions	Packaging	
636	Contractions	Saving gasoline	
637	Adjectives	Geothermal energy	
638	Compound words	Mass transportation	
639	Homonyms	Vocabulary	
640	Synonyms	Vocabulary	
641	Alphabet	Transportation	
642	Prepositional phrases	Transportation, bicycle	
643	Word find	Environmental laws	
644	Verb-subject agreement	Pollution, air	
645	Syllables	Vocabulary	
646	Sequencing	Sun, original energy source	
647	Abbreviations	Environmental agencies	
648	Antonyms	Supply and demand	
649	Fact or opinion	General	
Math			
650	Addition, 4 digits	Airplanes	
651	Subtraction, 4 digits	Population growth	
652	Equivalents	Sources of energy	
653	Division	Energy sources	
654	Addition	Half-life	
655	Expanded notation	Wildlife preserves	

Page No.	Skill	Conservation Topic	District Curriculum
656	Addition, money	Recycling	
657	Word problems, 2 step	Recycling	
658	Fractions, addition	Transportation	
659	Fractional parts	Transportation	
660	Word problems	Computing gas mileage	
661	Fractions, reducing	Transportation	
662	Bar graphs, interpretation	Population	
663	Circle graph, fractions	Trash	
664	Expanded notation	Agencies, send aways	
665	Word problems, subtraction	Transportation	
666	Word problems, division	Transportation	
667	Decimals	Water pollution	
668	Decimals, fractions	Fossil fuels, energy	
669	Percentage amounts	Use of land	
Social Studies/Science			
670	Visual discrimination	Solar energy	
671	Literal comprehension	History of solar energy	
672	Literal comprehension	Nuclear energy	
673	Interpretive comprehension	Alternative energy sources	
674	Interpretive comprehension	Supply and demand	
675	Interpretive comprehension	Energy balance	
676	Map reading	Oil production	
677	Map reading	Pollution locations	
678	Decoding	Environmental problems	

Page No.	Skill	Conservation Topic	District Curriculum
679	Word definitions	Population problem	
680	Predicting consequences	Population problem	
681	Cartoon interpretation	Population	
682	Decoding	Transportation	
683	Diagrams, usage	Land use	
684	Visual interpretation	Transportation, land use	
685	Sequencing	Automobile recycling	
686	Critical thinking	Government laws	
687	Chart reading	Quality index	
688	Decoding	Conservation agencies	
689	Critical thinking	General	
Related Activities			
690	Introduction		
691	Arts and Crafts	Gourd Birds	
692	Arts and Crafts	Tin can Lanterns	
693	Arts and Crafts	Leaf Skeletons	
694	Growing Plants	Gourds	
695	Growing Plants	Pineapple tops	
696	Music	"This Land Was Made For You and Me?"	
697	Send Aways	Conservation materials	
698	Send Aways	Conservation materials	
699	Student bibliography	Conservation books, fact and fiction	

Name ____________________________

RECYCLE OR REUSE?

We all know that the earth's supply of resources is limited. The faster we use the minerals and fossil fuels from the earth, the sooner they will be gone. We need these minerals and fuels to provide energy and products for our everyday living. The best way to protect our supply of natural resources is to conserve what we have.

Recycling is important because it saves our material resources and prevents waste and trash build-up. Although it requires far less energy than manufacturing items from mined ores, it does take energy to recycle old products into new ones. Fuels are needed to transport materials to recycling centers and to provide power to run the machinery that will crush, melt, and mold the old items into new ones.

Better than recycling is simply to avoid waste in the first place by reusing things. This conservation method saves our natural materials and the energy needed to make new products. Some examples of this type of conservation include:

- buying products that will last a long time or can be easily repaired, or
- buying products in reusable containers, such as returnable milk or soda bottles, or
- giving out-grown clothing to other people who can use it, and
- repairing or painting old furniture.

Many items can also be reused for different purposes. Old jars may make pretty flower vases, unusable clothing can become dust rags, and many craft projects can be made with discarded materials.

To help conserve our natural resources and energy, reuse all you can and recycle the rest.

Draw a line under the correct words for each sentence.

1. Recycling uses less / more energy than manufacturing items from mined ores.

2. Recycling is important because it saves energy. / gets rid of waste and saves materials.

3. Recycling / Reusing materials requires no fuel for energy.

4. The best way to conserve our natural resources of materials and energy is to recycle items. / reuse items.

Name ______________________

DIRECTIONS: Use the words in the box to complete the story. Read the story again to be sure it makes sense.

amount	safety	environment	expenses	pollutants
accidents	storage	uranium	sabotage	temperature

Nuclear Energy

There is more disagreement over the use of nuclear power than any other source of energy.

People who believe that nuclear energy is a good alternative source of power list the following reasons.

. Nuclear reactor power plants do not produce the air ______________________ associated with coal and other fossil fuel plants.

. Nuclear energy plants use only a small ______________ of fuel. Breeder reactors 'breed' or create more energy than they use.

. The fuels necessary, like ______________ are plentiful enough to last for hundreds of years.

. Nuclear energy is better for the ______________________ because the fuels necessary require less digging and mining.

. Nuclear power plants have higher ______________ regulations than any other type of plant.

NUCLEAR POWER NOW

People who are against nuclear energy list these reasons.

. There is the danger of ______________ which could allow radioactive materials to escape into the environment and endanger life.

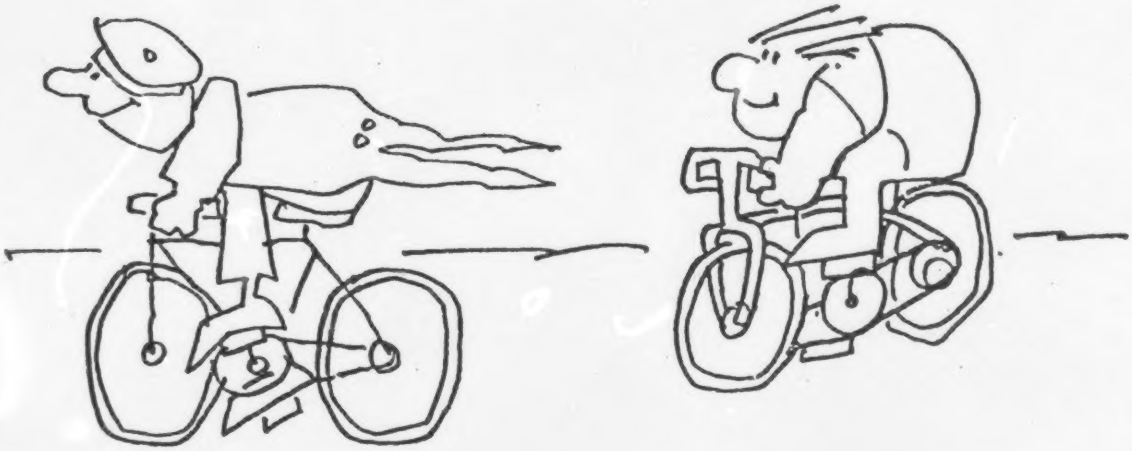
. Radioactive wastes must be stored for hundreds of years before they are safe. Safe ______________ and the effects on future generations are questionable.

. Hot water is a waste material which can raise the ______________________ of streams and oceans and could destroy wildlife.

. The danger of theft and ______________ is frightening. These are the same materials used to make atomic bombs.

. ______________ of building nuclear plants do not make it an economical power source.

Name ______________________________



THE BICYCLE - An Alternate Means of Transportation

Because of the growing concern regarding pollution caused by automobiles and the need to conserve our energy resources, many people are looking for different types of transportation. Here are some reasons to consider 'the bicycle'.

Today, many people live in cities where the air is heavily polluted. Much of this pollution in urban areas is caused by the automobile. Bicycles cause no air pollution because they run on muscle power rather than fossil fuels. Transportation uses 25 percent of our total energy budget and the automobile uses 55 percent of this. The bicycle is energy efficient. Two and one-half billion gallons of gasoline could be saved each year if trips less than two miles were taken by bike. Automobile traffic also increases noise pollution that can affect our behavior and health. The bicycle is noise free.

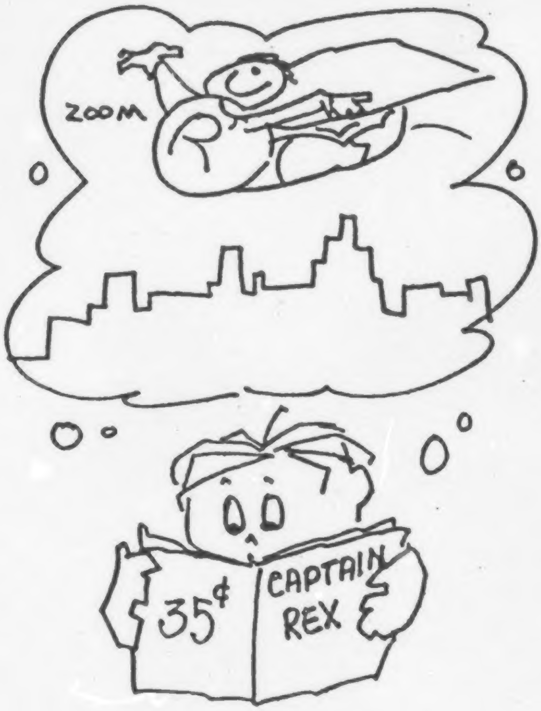
Riding bicycles can also improve our health. Lack of regular exercise has been connected with many of today's health problems. Bike riding can provide the healthy exercise we need and provide recreational fun too.

The bicycle is also an economical form of transportation. The maximum yearly cost to maintain a bicycle is about $50, compared to approximately $1,200 on the average for operating an automobile. Buying a car often costs over $5,000 whereas a bicycle can be bought for $50 to $400. Bikeways are also less expensive to build than streets and highways and we would need less land for parking. Eight bicycles can be parked in the same space as one automobile.

Bikes are also less wasteful. One hundred bicycles can be made from the materials needed to make one automobile.

For short trips, more and more people are finding advantages to using the bicycle as an alternate means of transportation.

Use the back of this paper to make a list of the advantages of using a bicycle. Can you think of some disadvantages? List them too.



Name ________________________________

Everyone would like to see clean air and water and land that is free from waste and litter. But, to get this pollution-free environment usually requires some compromise.

We often blame industry for many of our pollution problems. Dirty fumes from factory smokestacks, waste materials in run-off water, and chemical dumping are all things we would like to stop. We have even made laws to control some of this pollution.

But, when factories are forced to install equipment that will filter or clean their wastes, it costs them money. This higher cost is often added to the price of their product. This means that you, the buyer, will now have to pay more money for the same product.

For example:

The Captain Rex Comic Book Company had been printing comic books and selling them for 25¢ each. Part of their manufacturing process included pulp making which sent gallons of dirty water into the river next to the factory. People in the town complained that this water was polluting the river. They wanted the Captain Rex Company to install filters to clean the water and end the pollution. The environmental laws also demanded that the pollution be stopped so the company installed the new filtering equipment. However, the filters were very expensive so they raised the price of their comic books to 35¢ to help pay for the equipment. Now the people are angry because the comic books cost more.

Write the answers to these questions.

1. What was causing the river pollution?

____

____

2. Who wanted the pollution stopped?

____

3. Why did the Captain Rex Comic Book Company raise the price of their books?

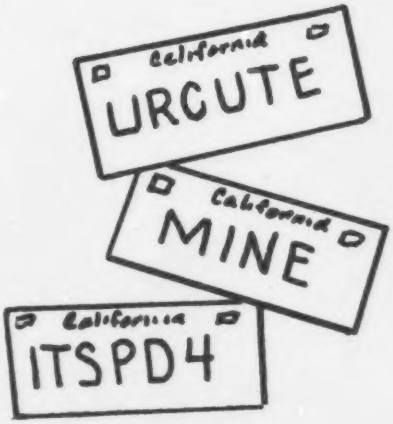
____

____

4. Do you think the company did what the people wanted? Why or why not? (use the back of this paper to explain your answer)

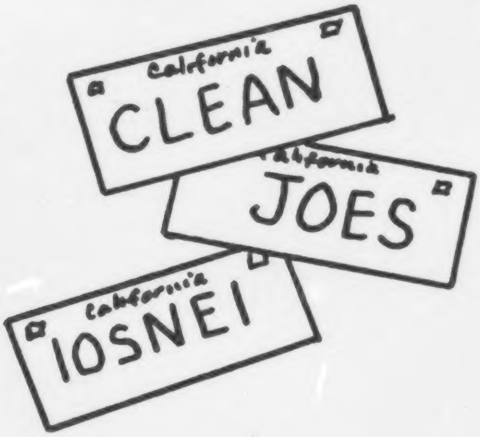
Name ______________________________

Environmental License Plates



Have you seen personalized license plates on cars? These are the license plates that have names, messages or funny sayings. They are called environmental license plates.

The extra money that people pay for these license plates is used to help our environment. Some of the money is used for research projects such as ways to get rid of air pollution or prevention of soil erosion. Other funds are used to buy land for animal reserves or natural areas. School programs to teach conservation are also made possible with money from these license plates.



People who want these license plates must fill out an application at their local Department of Motor Vehicles. They are asked to check a list of over 480,972 licenses (as of January 4, 1979) to be sure that someone else does not already have the one that they want.

The cost is $25.00 when you apply and then $10.00 a year over your regular license fee. There is also a charge of $12.00 to transfer the license plates from one car to another.

Names or messages are limited to seven characters (numbers or letters).

Answer the questions.

1. Write three things that the money from these license plates is used for.

   ____

   ____

   ____

2. How much do they cost when you apply? ______________

3. How much more per year than your regular license fees do you pay? __________

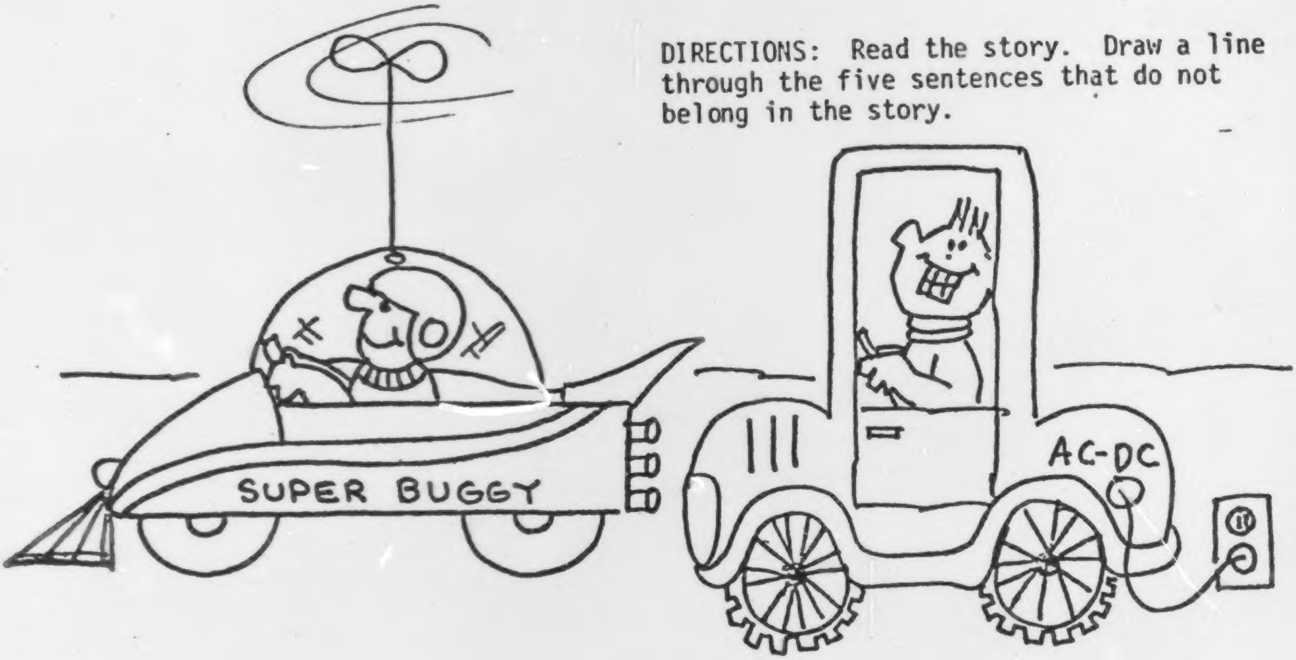
4. How many environmental license plates are there (as of 1/4/79)? __________

5. If you could order one, what would it say?

   __ __ __ __ __ __ __

Name ______________________________

DIRECTIONS: Read the story. Draw a line through the five sentences that do not belong in the story.



Transportation for Tomorrow

Much of our energy and natural resources are used for transportation. Oil and minerals are used both to manufacture cars and to make them go. Fire engines are painted red. With both energy and resources running low, alternative methods of transportation are being sought.

Try to imagine a different method of transportation for the future. Here are some changes you might find.

Cars on the street are an uncommon sight. People are now using their own muscle power and are walking whenever they can. There are bike-type vehicles of all sizes and shapes, from unicycles to mopeds to all-weather plastic enclosed three-wheelers and five-seaters. The bicycle was invented in Germany. There are golf-cart size electric cars for transporting greater numbers of people than bikes can handle. You may see electric vans and busses for public transportation. These might run down the centers of streets, separated from the bicycle lanes. Here and there you may see larger cars, to be used for long distance trips, which have been rented from city car pools. Water pollution is a major problem in our country.

Electric vehicles may run on miniature batteries which can be recharged by plugging them into solar power sources. A volcano is an example of geothermal power. Other vehicles may run on alcohol-based fuels made from agricultural wastes or special crops grown for this purpose. Scientists are developing new pesticides.

All of these ideas are possible now but change is not easy and there are problems to overcome. Finding solutions is a challenging opportunity for people interested in improving our environment and saving our resources.

Name ______________________________

DIRECTIONS: The energy headings are missing in the outline below. Use the possible sources of energy listed in the box to fill in the blank spaces.

Hydroelectric	Wind	Shale	Tidal	Solar
Nuclear	Garbage	Geothermal		

1. ______________________

   A. Represents energy from the sun.
   B. May be used directly or changed into steam or electricity.

2. ______________________

   A. Produced by steam formed from water warmed by underground heat.
   B. Can turn turbines to generate electricity.

3. ______________________

   A. Rock sometimes containing oil.
   B. Must be broken and palced under heat and pressure to release oil.

4. ______________________

   A. Solid waste thrown away can be burned to produce heat.
   B. Gas from decomposing waste can be collected and used for fuel.

5. ______________________

   A. Has been used for centuries to turn windmills and pump water.
   B. Can generate electricity.

6. ______________________

   A. Produced by falling or rushing water.
   B. Dams are often built to provide this type of energy.

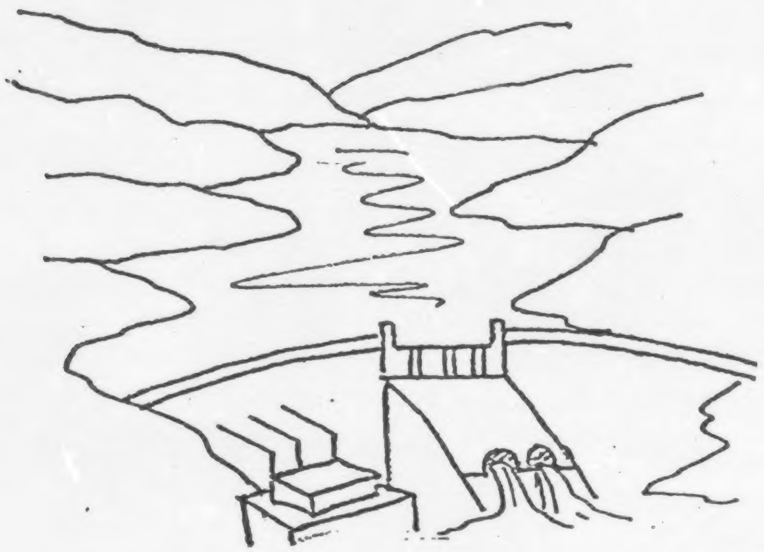
7. ______________________

   A. Atoms contain great amounts of energy.
   B. Must be changed in large plants to produce heat for electricity.

8. ______________________

   A. Levels of ocean waters are constantly changing.
   B. If harnessed, they can produce great amounts of energy.

Name ______________________________



DAMS

We have had dams in America for hundreds of years. At first, people built small dams to create energy for waterwheels or millstones. Other small earth dams were built to provide ponds for people to fish and swim in.

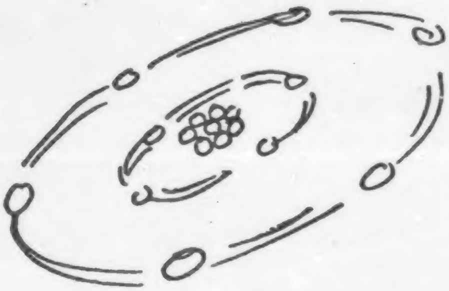
Today we have large dams on many of our rivers. Water stored behind these dams is used to make electricity. It can also be used to irrigate crops or provide drinking water for people in cities far away. Dams also prevent floods by holding back the water from heavy rains and melting snow. The large lakes formed behind the dams often provide recreation areas for boating, fishing, and swimming.

However, dams have also created problems for our environment. When a dam is built, part of the river and the valley behind it are destroyed. Animals and people who lived there are forced to move. Some animals cannot easily adapt to new habitats. Some have even become endangered. Also, land along the rivers is usually fertile and very good for growing crops. Many acres of valuable farmland are lost when dams are built.

Although dams are often built to control floods, this is another problem created by dams. People often feel safe in building homes and factories on what was once a flood plain. They think the flood danger is gone because of the dam. But, sometimes there is so much rain and melted snow that the river overflows anyway. This causes great damage to homes and factories that are built on the flood plains.

People are now looking very carefully at the good and bad effects of building dams.

Use the back of this paper to list three good and three bad effects of building dams.



Name ______________________________

Nuclear power is an important source of energy. Uranium atoms are split by a process called fission. The high heat which results is used to produce steam, which in turn generates electricity.

There are several reasons why nuclear power is not being developed as fast as possible.

First, many people think that the nuclear reactors, where the atoms are split, are not safe. They are afraid that radiation may leak or explosions will occur that could contaminate people and wildlife.

People are also concerned about the disposal problems of nuclear waste. The process of developing nuclear energy creates radioactive waste materials which must be stored for hundreds of years.

A third reason is that it takes a long time to get a nuclear plant working. Sometimes it can take as long as twelve years before a new plant can begin operating.

Lastly, costs for building the nuclear plants have greatly increased. The cost of construction materials, labor, and uranium fuel is very high.

In 1978, there were some 69 nuclear power plants in operation. They produced about 12% of our electricity. By 1995, as many as 200 could be in operation if we could solve some of these problems.

Answer the following questions.

1. The main idea of this story is (underline the best choice)

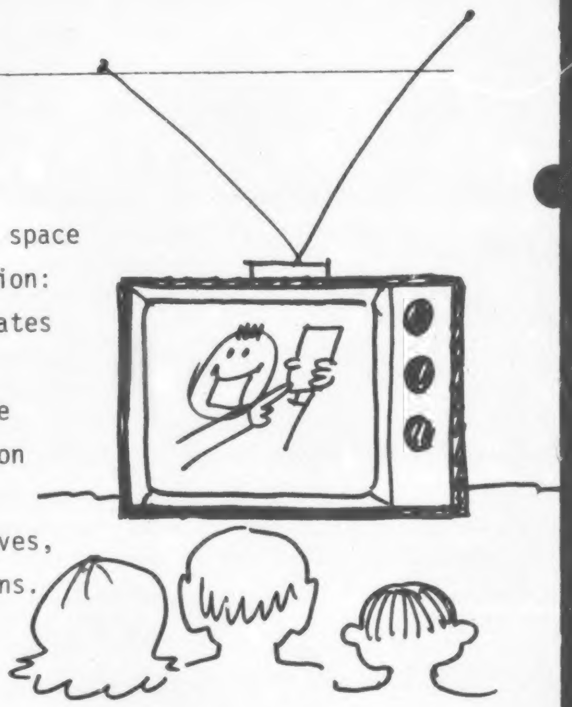
   the danger of uranium atoms.
   problems of nuclear energy.
   power sources of the future.

2. Write four reasons why nuclear power is not being developed faster.

   ____
   ____
   ____
   ____

Name ______________________________

WHAT IS RADIATION?



Radiation is defined as energy moving through space as invisible waves. There are two types of radiation: ionizing and non-ionizing. Ionizing radiation creates electrically charged ions which can disrupt body processes, including life. Nuclear weapons produce ionizing radiation, as do X-rays and some television sets.

Non-ionizing radiation is produced by microwaves, light and sound but lacks the ability to create ions. It can, however, disrupt body processes too. It usually causes sickness rather than death, but too much can be fatal.

All of us are exposed to radiation every day. Most of it is low-level radiation that poses a minor, but continual risk.

Radiation is measured in roentgens or milliroentgens. (There are 1000 milliroentgens in a roentgen.) A dental X-ray emits about 200 milliroentgens. By law, TV sets may not emit more than half a milliroentgen an hour.

But when scientists talk about danger, they talk about rems, or millirems, which refer to the amount of radiation energy absorbed by the body. The average person gets about 100 to 120 millirems a year from background radiation.

Use the information above to complete the sentences.

1. There are 1000 milliroentgens in a ______________________________.

2. The amount of radiation absorbed by the human body is measured in ____________.

3. Nuclear weapons produce __________________________ radiation.

4. Radiation produced by light and sound lacks the ability to create ____________.

5. The average person gets about __________________________ millirems a year.

Name ____________________

DIRECTIONS: Read the story. Follow the directions to find the answer to the riddle.

WIND POWER

The wind is one of our oldest and best-understood energy sources. People have used it to move ships across the oceans for thousands of years. In areas where there are steady breezes, modern windmills can generate huge amounts of power.

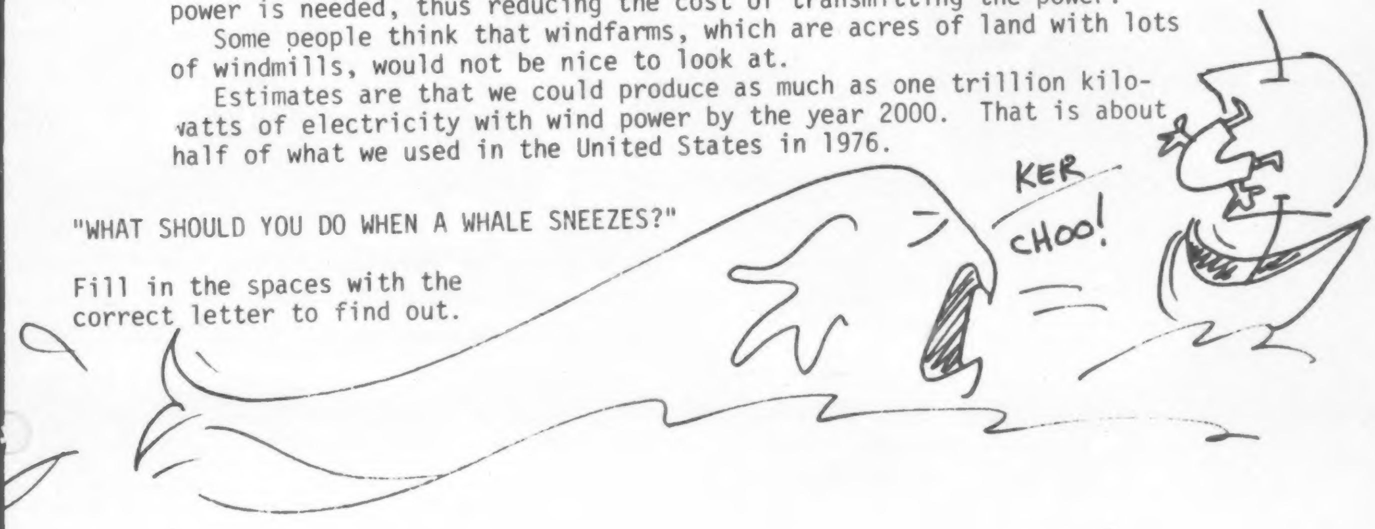
A big advantage to using wind power is that, like solar power, it is quiet and nonpolluting. It is also free and cannot be used up. Another advantage is that windmills can be located close to where the power is needed, thus reducing the cost of transmitting the power.

Some people think that windfarms, which are acres of land with lots of windmills, would not be nice to look at.

Estimates are that we could produce as much as one trillion kilowatts of electricity with wind power by the year 2000. That is about half of what we used in the United States in 1976.

"WHAT SHOULD YOU DO WHEN A WHALE SNEEZES?"

Fill in the spaces with the correct letter to find out.



___ ___ ___   ___ ___   ___ ___ ___ ___   ___ ___ ___ ___!
1 2 3   2 1   4 5 2 6   7 8 9 10

Space No.		
1	True = R, False = P	Wind power is expensive to use.
2	True = U, False = A	Acres of windmills are called windfarms.
3	True = B, False = T	Wind power is a new energy source.
4	True = Y, False = D	Some people think windfarms would be ugly to see.
5	True = I, False = O	Wind power cannot be used for transportation.
6	True = R, False = S	Wind power is nonpolluting.
7	True = S, False = H	Kilowatts are used to measure electricity.
8	True = M, False = A	Wind power is very noisy.
9	True = I, False = W	We know a lot about wind power.
10	True = L, False = T	Wind power is an alternative energy source.

Name ______________________________

DIRECTIONS: Write past, present, or future in the space after each sentence to show the correct tense.

1. Population affects our environment in many ways. ____________________

2. In 1650, the population of the world was about 500 million people.

____

3. By the year 2000, there may be 7 billion people on the earth. __________

4. Some people worry that there is not enough food or space for all these people. ________________________

5. Population growth has been blamed by many as the major cause of pollution. ________________________

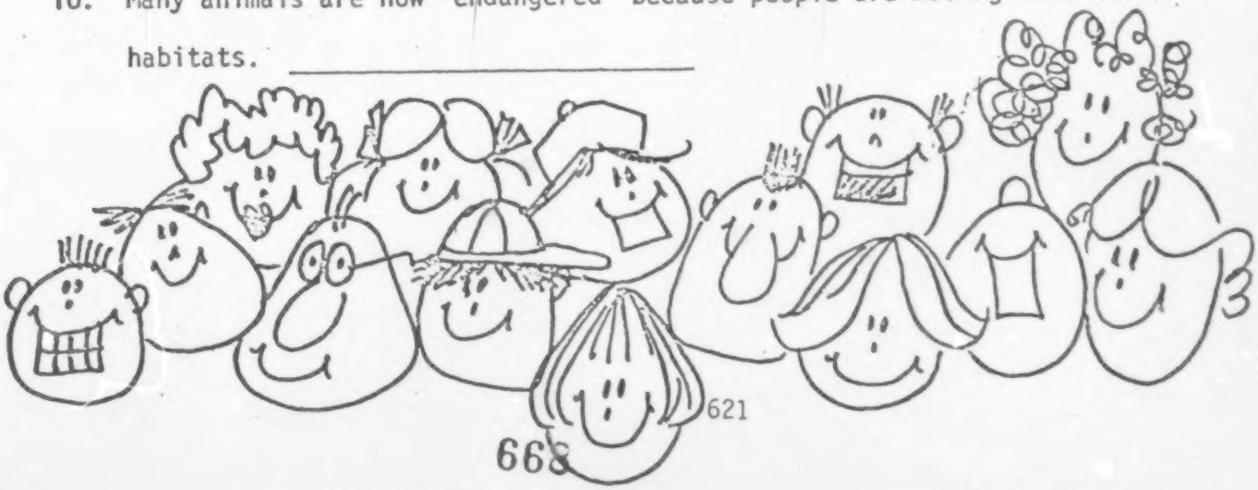
6. We have an "energy crisis" because there are many more people in the world today. ________________

7. The United States has 6% of the world's population. __________________

8. More people will need more natural resources from the earth. __________

9. There used to be enough land for both animals and people. ____________

10. Many animals are now "endangered" because people are moving into their habitats. ______________________



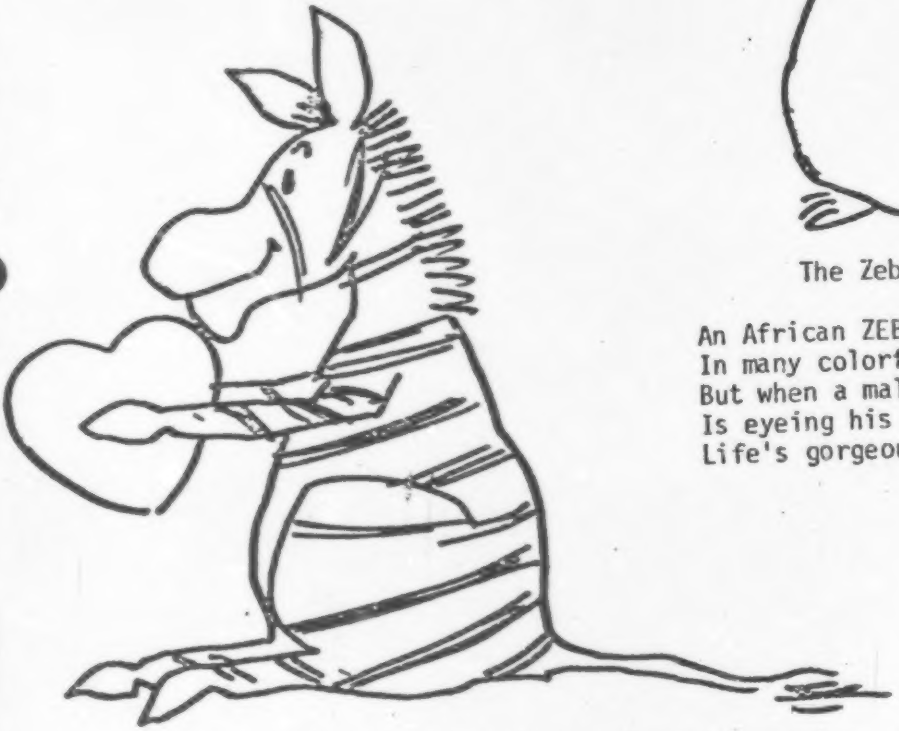
621

The number of people on the earth is increasing every year. People have moved onto the land where animals made their homes. Many animals have become endangered species because they have no place to find food or build their homes.

Read the limericks about two animals that are now endangered species.

The Sea Otter *

There's many a baby SEA OTTER
That's lost its mother and fotter.
Though once their reduction,
Neared otter destruction,
If we bother there'll soon be a lotter.



The Zebra *

An African ZEBRA delights
In many colorful sights.
But when a male zebra
Is eyeing his shebra,
Life's gorgeous in plain black-and-white.

Here is a list of some other endangered species. Use the back of this page to write your own limerick about an endangered animal.

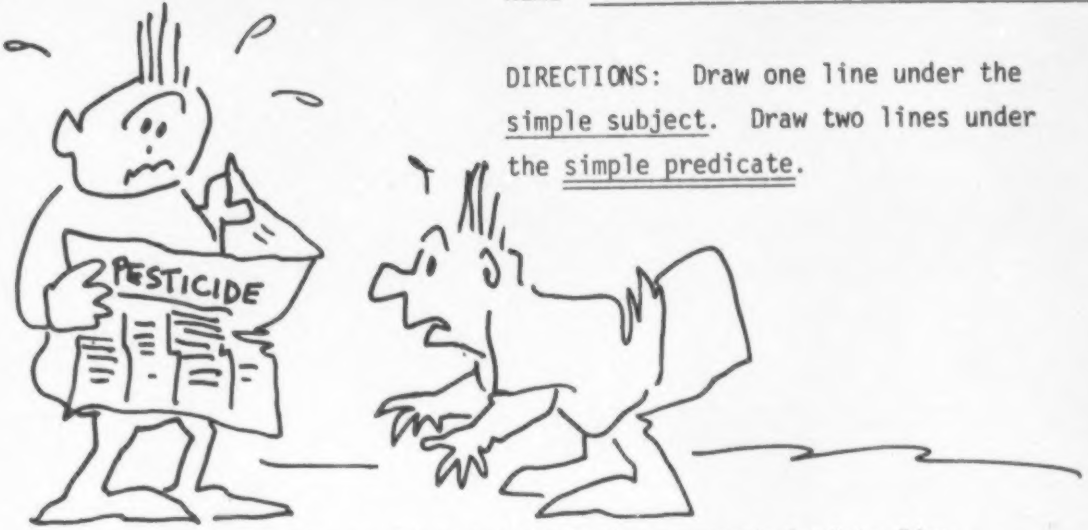
Tiger
Blue Whale
Timber Wolf
Gorilla
Cheetah
Manatee
Polar Bear
Panda
Red Kangaroo
Yak
Whooping Crane
Rhinoceros

---

* Life is No Yuk for the Yak, Don Lessem

Name ________________________________

DIRECTIONS: Draw one line under the simple subject. Draw two lines under the simple predicate.



1. Many people in the world today don't have enough food to live.

2. The world's population is continuing to increase.

3. More people will need more food.

4. Only 30% of the world's land is suitable for growing food.

5. Houses, factories, and highways are often built on lands that could be used for growing food.

6. Insects can destroy valuable food crops.

7. Pesticide use can increase crop production up to 100%.

8. Farmers can get twice as much food from the same plant.

9. But, pesticides are also dangerous to the environment.

10. They kill good insects and animals as well as the troublesome ones.

11. Population, pesticides, and food needs are big problems.

12. We need to find some solutions soon.

Name ______________________

DIRECTIONS: Write yes in front of each group of words that is a complete sentence.
Write no in front of each group of words that is not a complete sentence.

______ 1. Ocean tides can be used to create energy.
5 8 13

______ 2. At the Bay of Fundy, in Nova Scotia, where the tides rise and fall over forty feet.
7 2 4

______ 3. When the tide rises, the water is trapped by dams.
3 14

______ 4. As the water is released.
6 9

______ 5. This creates energy just like rivers and waterfalls.
4 7 9

______ 6. Tidal energy is not created by the power of the waves.
11 1 10

______ 7. The costs of building the large dams needed.
1 8

______ 8. Tidal energy does not seem like a realistic alternative at this time.
6 2 12

Use the numbered letters in the complete sentences only to find out:

"What did the ocean say to the shore?"

1 2 3 4 5 1 6 ' 5 3   7 8 9 3

10 11 12 13 14 !

Name ______________________________

DIRECTIONS: List the following words under the environment in which they would most likely be found.

watershed aerosol mulch salinity flume erosion
compost carbon monoxide reservoir smog strip mining
chlorination ozone algae green belts atmosphere
inversion hydro

WATER	EARTH	AIR
1______________________	1______________________	1______________________
2______________________	2______________________	2______________________
3______________________	3______________________	3______________________
4______________________	4______________________	4______________________
5______________________	5______________________	5______________________
6______________________	6______________________	6______________________

Using the same words, fill in the sentences with the correct word.

1. The ______________________ is the body of air that surrounds the earth.

2. ______________________________ tells how much salt is in water.

3. Simple rootless plants that grow in water are called ______________________.

4. Aerosol spray cans are believed to be dangerous to the ______________________ layer of the atmosphere.

5. The land area that drains into a stream is called the ______________________.

Name ______________________________

DIRECTIONS: Complete the sentences. Use the clue words to answer the riddle.

1. Twenty five percent of the energy we use is for

2 4 12 15 1 3 5 4 2 12 2 13 5 15.

2. Cars are the largest source of air 3 5 9 9 8 2 13 5 15.

3. Buses and trains are forms of 11 12 1 1 2 4 12 15 1 13 2.

4. Most cities have half of their land paved for the use of the

12 8 2 5 11 5 17 13 9 14.

5. Railroads use less energy per mile hauling freight than 2 4 8 10 7 1.

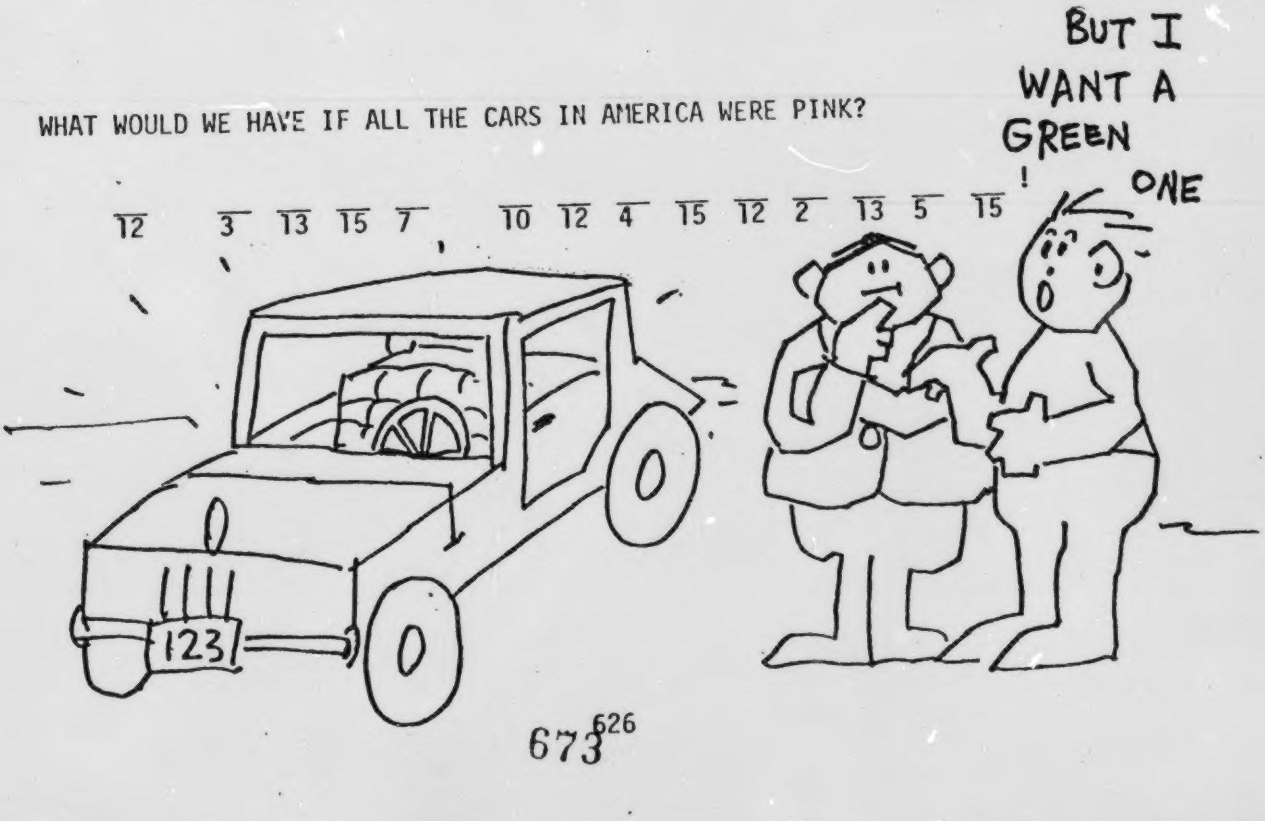
6. Driving at slower speeds saves 18 12 1 5 9 13 15 14.

7. The fossil fuel used to make gasoline is 5 13 9.

8. Whenever we can, we should ride a bike or 6 12 9 7.

WHAT WOULD WE HAVE IF ALL THE CARS IN AMERICA WERE PINK?

12 3 13 15 7 10 12 4 15 12 2 13 5 15


BUT I WANT A GREEN ONE!
123

Name ______________________________

DIRECTIONS: Complete this outline using the topic headings below.

Encouraging Mass Transit

Improving Commuter Habits

Reducing Automobile Size and Weight

Using Railroads More

TRANSPORTATION

A. Accounts for 25% of our total energy use

B. Ways of saving energy

1. ______________________________
   - a. Each 400 pound weight reduction improves performance by one mile per gallon.
   - b. New mileage requirements for American cars (must average twenty miles per gallon by 1980) will save 700,000 barrels of oil a day.

2. ______________________________
   - a. Increasing the number of passengers riding together can save additional fuel.
   - b. Companies should encourage car pooling.

3. ______________________________
   - a. Railroads can haul freight over long distances using only one quarter the energy per ton/mile that trucks need.

4. ______________________________
   - a. Buses or trains use less than half as much energy per passenger mile as private autos.

Name ______________________________

Many people are trying to invent cars that don't run on gasoline. Unscramble the words to complete each sentence. Write the words on the spaces.

1. Gasoline is made from LIO. ___ ___ ___

2. Oil is a fossil LUEF that is being used up rapidly. ___ ___ ___ ___

3. People have made TEELCCIR cars. ___ ___ ___ ___ ___ ___ ___ ___

4. Even MEATS engines have worked in cars. ___ ___ ___ ___ ___

5. LOARS energy engines are being tried also. ___ ___ ___ ___ ___

6. Scientists are continuing to look at all BILITOSSPEISI.

___(1) ___ ___ ___ ___ ___(2) ___ ___ ___ ___ ___ ___(3) ___

Use the last word to complete the riddle.

Bob - "I have a car that has no engine and no wheels. All it has is a horn."

Joe - "How does it go?"

Bob - "___(2) ___(3) ___(3) ___(1)! ___(2) ___(3) ___(3) ___(1)!"

675

Name ______________________________

DIRECTIONS: Todd is writing a report about the use of solar energy for heating. He has misspelled ten words. Find the words and draw a circle around them. Write the words correctly at the bottom of the page.

SOLAR HEATING

The sun can provide 50 to 80% of our home heating needs. Thousends of solar water and space heating sistems are already operating.

Here are some of the advantages of solar heating.

1. *Operateing costs after the initial installation are low except for maintenance.*
2. *Solar heating is nonpoluting. There is no noise and no waste.*
3. *Technology is developing rapidley. Relyable collectors and other materials are widely available.*

The biggest disadvantage to solar heating is that it is expensive to enstall in allready existing homes. People can get money back from their taxes for solar devices they have bought. Perhaps this will encourag more people to use solar heating.

Solar heeting is an alternative that's "here and now".

By Todd

Write the words correctly on the spaces below.

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________
6. ______________________________
7. ______________________________
8. ______________________________
9. ______________________________
10. ______________________________

Name ______________________

Read the Table of Contents

TABLE OF CONTENTS

Foreword 3

Energy
- *The Energy Crisis 6*
- *Nature's Storehouse 11*
- *Nuclear Power 16*
- *Harnessing the Sun 21*

Chemicals
- *Pests and Poisons 28*

Air
- *Causes of Smog 32*
- *Cleaning Up Our Air 44*

Water
- *The Water Cycle 47*
- *Disposing of Sewage 49*
- *Pure, Clean Water, Again 52*

Land
- *Restoring the Earth 61*
- *The Problem of Litter 73*

Between what pages will you find information on the following subjects?

Subject — Between page ? and page ?

1. Using solar energy for heating water. ______ ______
2. The automobile is the largest cause of air pollution. ______ ______
3. Evaporation of rivers and lakes forms clouds to provide rain. ______ ______
4. Bottles and cans are polluting our land. ______ ______
5. The benefits and dangers of atomic power. ______ ______
6. Governments have set clean air standards. ______ ______
7. Trees and minerals are some of our natural resources. ______ ______
8. Insecticides kill good insects as well as harmful ones. ______ ______

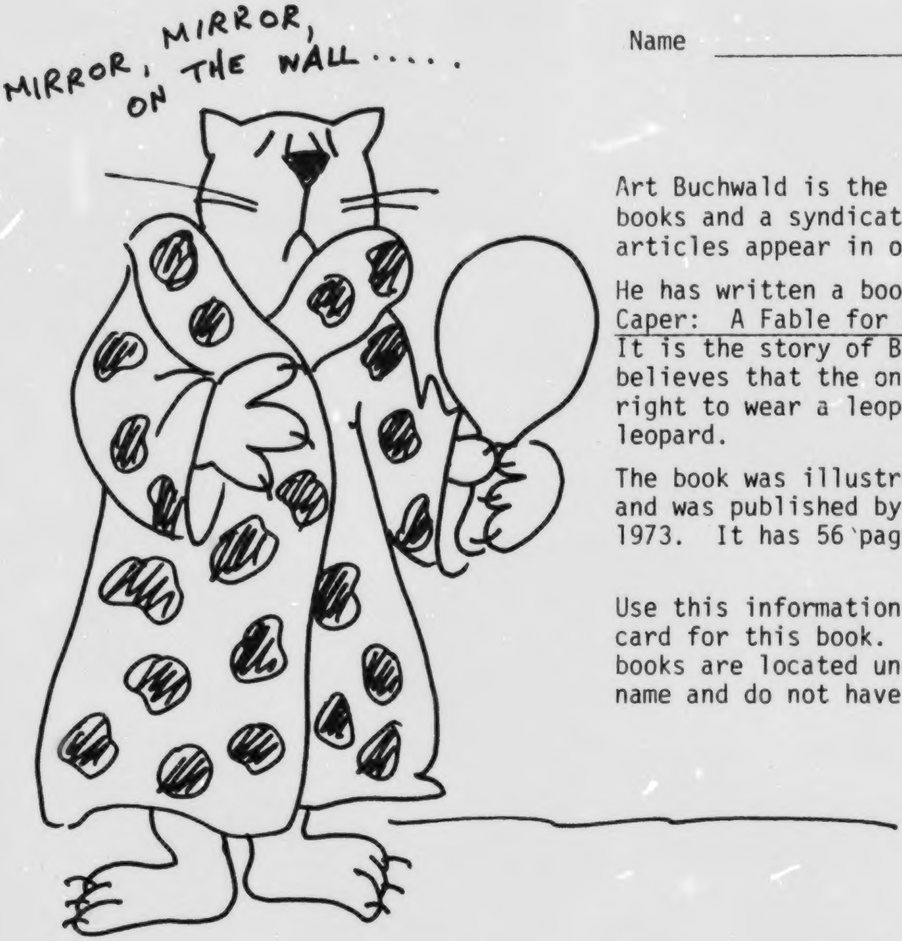
Name ______________________________

DIRECTIONS: Using the dictionary guide words, write the words from the list below on the pages where they would be found.

conservation tidal population pollution exhaust
environment hydroelectric geothermal radiation
reactor nuclear alternative solar technology

GUIDE WORD		GUIDE WORD
racket	radiation	radio
tea		teeth
hurry		inch
alphabet		although
geometry		geyser
exercise		face
tickle		timber
reach		read
poor		porcupine
soil		soldier
nothing		number
picture		poor

Name ______________________________


MIRROR, MIRROR, ON THE WALL.....

Art Buchwald is the author of thirteen books and a syndicated columnist whose articles appear in over 500 newspapers.

He has written a book called The Bollo Caper: A Fable for Children of all Ages. It is the story of Bollo the leopard who believes that the only one who has a right to wear a leopard fur coat is a leopard.

The book was illustrated by Julie Brinkloe and was published by Doubleday Company in 1973. It has 56 pages.

Use this information to make a library card for this book. Remember that fiction books are located under the author's last name and do not have library call numbers.

Conservation - Fiction — Subject

Call Number ____ ____

________________ Author

________________ Title

____

________________ Illustrator

________________ Publisher, Year

________________ No. of pages

Name ______________________________

DIRECTIONS: Underline each word that should begin with a capital letter.

1. an organization concerned with the number of people on the earth is called zero population growth - or ZPG for short.

2. the national audubon society is concerned with the protection of wild birds.

3. you can get environmental materials and posters from the national wildlife federation.

4. "the giving tree" is a book by shel silverstein about the relationship between a man and a tree.

5. captain hydro workbooks are available from the santa clara valley water district.

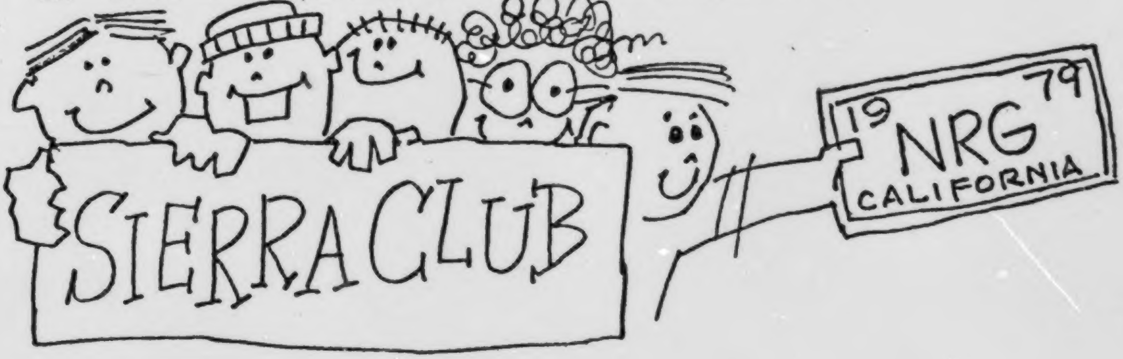
6. the walt disney company has a mickey mouse comic book about energy conservation.

7. another group concerned with protecting all of our environment is the sierra club.

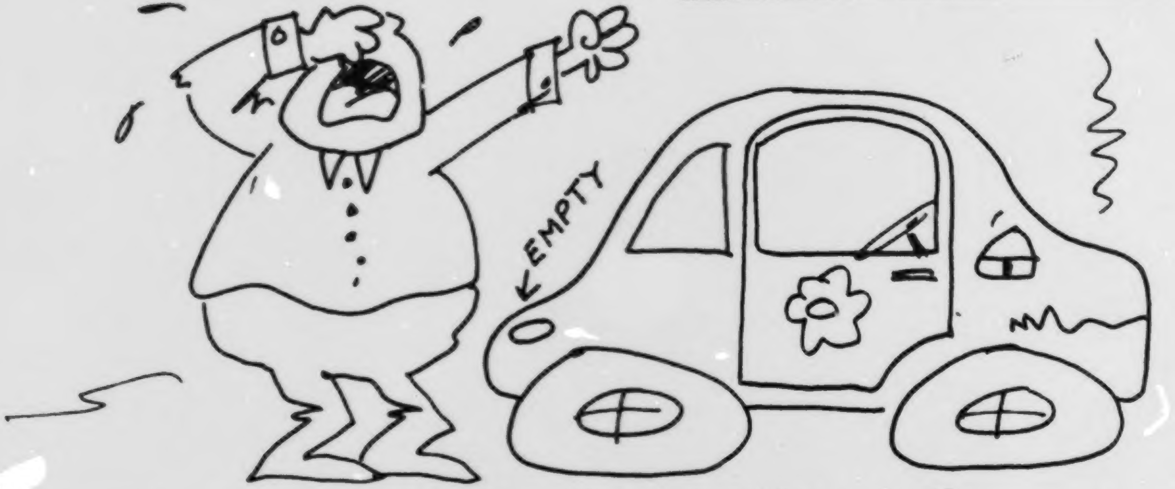
8. the california environmental protection agency uses the money from personalized car license plates to help our wildlife.

9. national wildlife week is usually held in the month of march.

10. there is a department of energy in washington, d.c.



Name ____________________



DIRECTIONS: Solve the riddle by answering the questions correctly.

Riddle: WHAT DID THE MAN SAY TO HIS GAS TANK???

____ If muscle power is the least polluting form of transportation, put O. If not, put B.

____ If most cars use natural gas for fuel, put A. If not, put I.

____ If car pools are swimming places for automobiles, put D. If not, put C.

____ If most cities have half of their land paved for automobile use, put U. If not, put I.

____ If highways are the largest thing built by man, put R If not, put D

____ If roads and highways do not disturb animal habitats, put E, if they do, put M.

____ If automobiles are the largest source of air pollution in California, put T. If not, put A.

Name ______________________________

DIRECTIONS: A conjunction connects single words, groups of words, or groups of ideas. Draw a line under each conjunction in the following sentences.

1. When people buy products with extra packaging, they are causing waste and pollution.
2. You can influence companies to stop wasteful packaging if you refuse to buy products with that type of wrapping.
3. Do not buy products in hard-to-dispose-of packages because they add to waste disposal problems.
4. Wrappings of cellophane, styrofoam, or those plastics made of polyvinyl chloride (PVC) give off harmful pollutants when burned and are not biodegradable.
5. Mixed packaging, such as cardboard containers with metal tops, are hard to recycle since the different parts must be separated.
6. Individually wrapped foods, such as cheese slices, bagged candies, and single-serving juice cans, are wasteful and cost you more money.
7. Take a string bag or shopping bag with you when you shop, and carry your purchases home in that.
8. Refuse a store bag if you don't need it.
9. Write to the presidents of companies that overpackage their products and ask them to change their packaging methods.
10. Use either china or glass instead of paper cups and dishes.
11. These may sound like little ideas, but they can make a big difference for our environment.

CHEESE SLICES
GOOPO SHAMPOO
JUICE
JUICE
JUICE

Name ______________________________

DIRECTIONS: Draw a line under the contraction in each sentence. Write the two words that form it on the blank lines.

Tips To Save Gasoline

1. Warming up a car engine isn't necessary. ______ ________
2. It wastes gas and doesn't make the engine run any better. ________ ______
3. It's true that the faster a car goes, the more gas it uses per mile. _____ _______
4. We'll save the most gas when we drive between 35 and 40 miles per hour. _____ _________
5. You shouldn't tie luggage or equipment on the top of your car. ______________ _______
6. They'll cause wind resistance which lowers your gas mileage. ___________ ________
7. The heavier your car is, the more gasoline you'll need. _______ _________
8. Every 400 pound weight reduction means you're improving performance by one mile per gallon. ________ _________
9. Plan wisely and don't take unnecessary trips. ______ ________
10. We can't afford to waste gasoline. ________ _________

Name ______________________________

DIRECTIONS: On the line at the right of each sentence write the adjective that modifies the underlined noun. Do not write 'a', 'an', or 'the'.

1. Geothermal power is produced by underground steam. ______________________

2. Underground water is heated by the molten rock in the earth's core. ______________________

3. This steam can form natural geysers such as Old Faithful in Yellowstone National Park. ______________________

4. Deep wells can also be drilled into the earth to use this steam for geothermal power plants. ______________________

5. The hot steam turns turbines which generate electricity. ______________________

6. Although this appears to be a free and lasting energy source, there are some difficult problems to be solved. ______________________

7. Underground water often contains corrosive salts, minerals, and parts of rock which can ruin pipes. ______________________

8. The hot mineral water cannot be allowed to mix with surface water because it can ruin land used for growing crops. ______________________

9. Another problem is the odorous gases which escape with the steaming water. ______________________

10. The rotten-egg smell of hydrogen sulfide is common with strong mineral waters. ______________________

11. Uses for waste heat generated by these plants also need to be found.

12. The waste heat could raise the temperature of surrounding areas and cause agricultural problems. ______________________

13. There is also the danger of the land sinking as large quantities of water are pumped up from beneath the earth. ______________________

14. Many people are working hard to find solutions to these problems. ______________________

Name ________________________________

DIRECTIONS: Read the story. Draw a line under the compound words. Write them on the spaces below.

Today, wherever we look there are automobiles. They are the biggest cause of our air pollution. Most cities have half of their land paved for automobile use and we are building more and more freeways every day. In fact, the largest thing built by man is the highway.

Years ago, most people in cities used streetcars and buses instead of cars. Many people also walked or rode bicycles to get to places.

Now, people who care about the environment are asking us to use cars less. They say we should travel on buses, railroads, or airplanes. This is called MASS TRANSPORTATION. When many people ride together in one vehicle, there is less pollution from power.

Another solution to automobile pollution is to use more muscle power. Walk or ride your bike whenever you can. Muscle power doesn't pollute at all. Remember, we all need to breathe, so air pollution is everyone's problem.

Compound Words

____

____

____

____

____

____

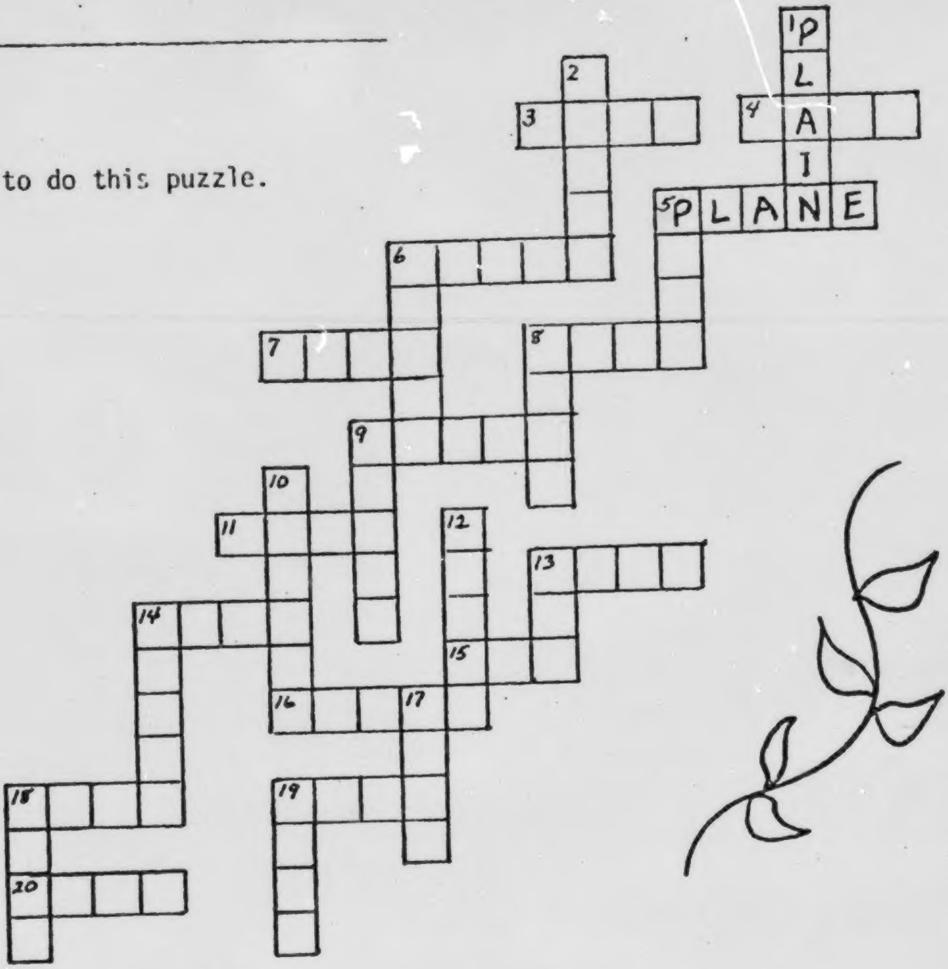
____

____

____

Name ____________________________

Use HOMONYMS to do this puzzle.



1 down and 5 across: not fancy; something that causes air pollution.

2 down and 16 across: you do it with a pencil; not wrong.

3 across and 8 down: what you do in church; hunted animals.

4 across and 20 across: part of the water cycle; a leather strap for horses.

5 down and 8 across: two of a kind; a fruit grown in California.

6 across and 19 down: complete; a place to put seeds.

6 down and 12 down: to use up our natural resources foolishly; a part of your body.

7 across and 13 across: uses a needle and thread; scatters seeds.

9 across and 9 down: freedom from war; a part of something.

10 down and 14 down: the blossom of a plant; used to make bread.

11 across and 14 across: a part of the chimney; past tense of fly.

13 down and 15 across: where all energy comes from; a father's boy.

17 down and 19 across: not there; to listen to.

18 across and 18 down: a large animal; how our forests will look if we keep cutting down the trees.

Name ______________________________

DIRECTIONS: Synonyms are words that have the same, or almost the same, meaning. Use these words to write a synonym for each of the words below.

pollute save compromise litter squander

opinion population environment nuclear energy

1. conserve ______________________________
2. contaminate ______________________________
3. power ______________________________
4. trash ______________________________
5. atomic ______________________________
6. belief ______________________________
7. surroundings ______________________________
8. inhabitants ______________________________
9. meet halfway ______________________________
10. waste ______________________________

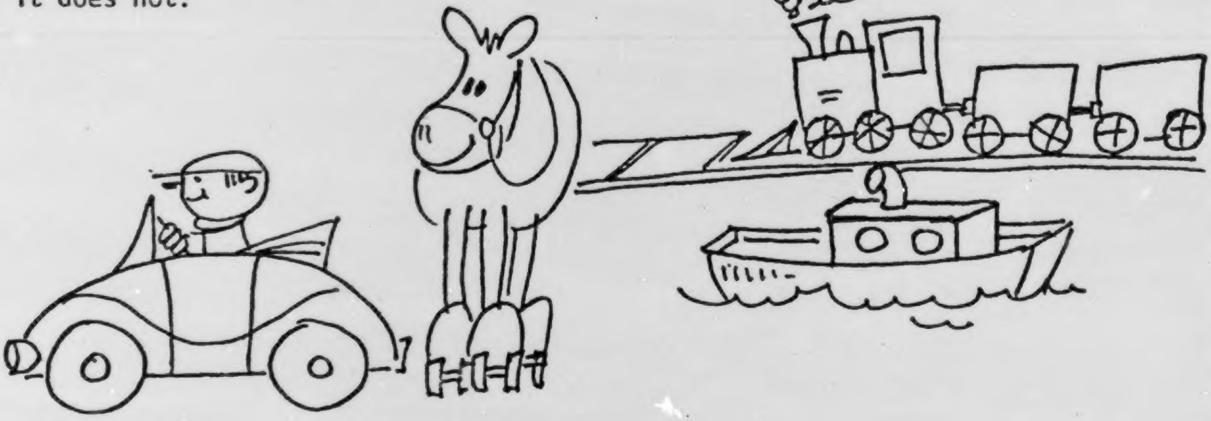
Use the first letter of the synonyms you write to find out "what has the greatest effect on our environment".

___ ___ ___ ___ ___ ___

2 7 6 8 4 3

Name ____________________

There are many different forms of transportation. Some cause air pollution and some do not. Write a method of transportation that starts with each letter of the alphabet. Write Yes after the word if it does cause air pollution. Write No if it does not.



A ____________________

B ____________________

C ____________________

D ____________________

E ____________________

F ____________________

G ____________________

H ____________________

I ____________________

J ____________________

K ____________________

L ____________________

M ____________________

N ____________________

O ____________________

P ____________________

Q ____________________

R ____________________

S ____________________

T ____________________

U ____________________

V ____________________

W ____________________

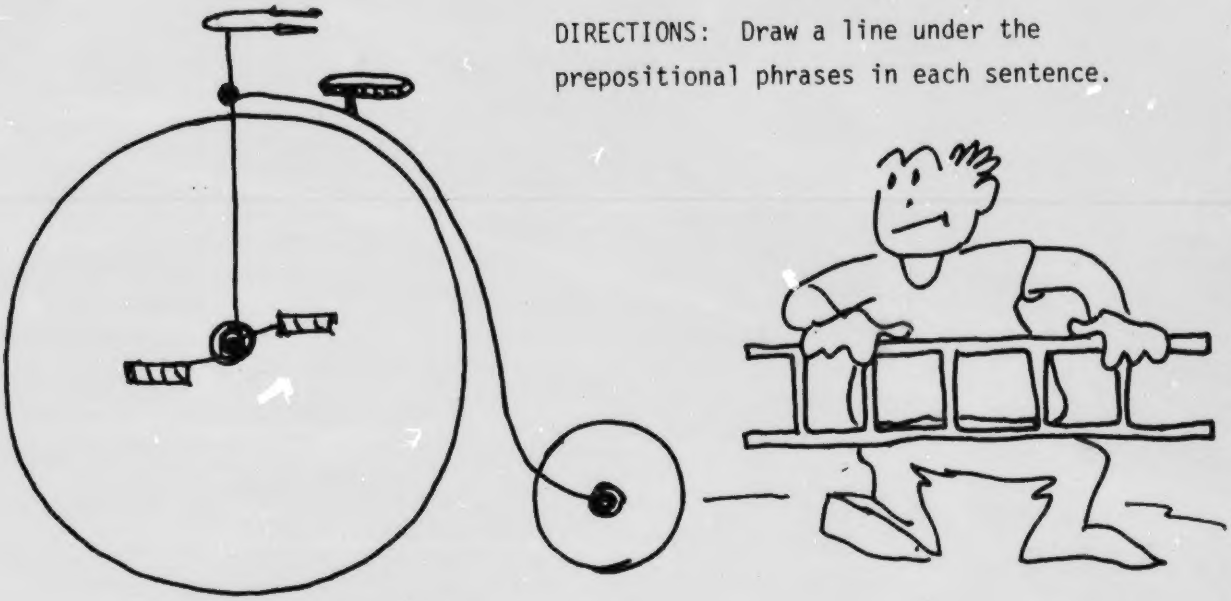
X ____________________

Y ____________________

Z ____________________

Name ______________________________

DIRECTIONS: Draw a line under the prepositional phrases in each sentence.



1. The first bicycle was made of wood.

2. It was invented in Germany in 1834.

3. At first bicycles were called "hobby horses".

4. The first bicycle in America was made in 1877.

5. It weighed over 70 pounds and at that time cost $313.

6. By the turn of the century, bikes were widely used by everyone.

7. Most of the police departments had bicycle patrolmen who arrested 12 mile an hour "speedsters".

8. Nearly all modern improvements in the automobile can be traced to the development of the bicycle.

9. In the 1970's, the bike has again become a popular form of transportation.

10. It is non-polluting for our environment and only uses 'muscle power'.

Name ______________________

DIRECTIONS: Complete the sentences by finding the missing word in the "word find". Write the word on the blank space to complete the sentence.

A L A W S B C
D I G I A W X
C C R L C A R
X E W D T T P
R N O I S E O
O S M O G R O
S E L T T O B
O S P W D A W

Protecting Our Environment

1. Many states have passed ______________ to protect our environment.

2. In California you can be fined $100 for throwing litter from a ____________

3. Some states allow soda to be sold only in returnable ______________________.

4. Hunting and fishing ______________ are required to protect our wildlife.

5. There are laws to prevent factories from polluting the air or ____________ with waste materials.

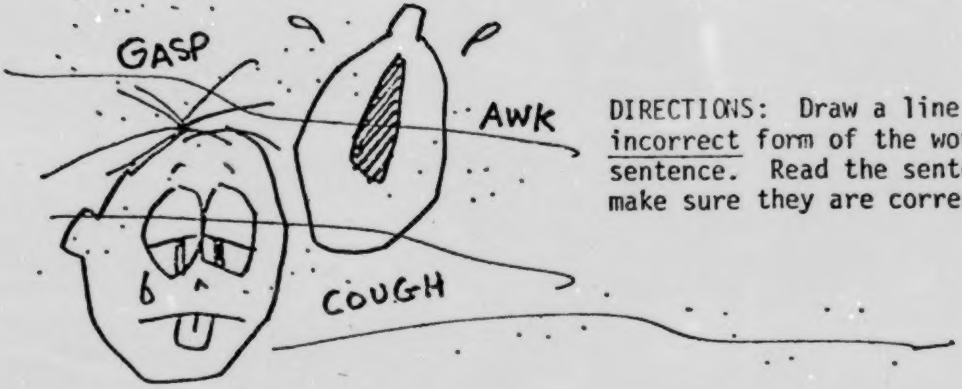
6. California requires ______________ devices on automobiles to lessen air pollution.

7. It is against the law to pick many ______________ flowers.

8. There are even laws against making too much ___________________.

Mom, Do you know the difference between unlawful and illegal?
Sure Son Unlawful m it's against law - Illeg means a s bird! Rig

Name ______________________________



DIRECTIONS: Draw a line through the incorrect form of the words in each sentence. Read the sentences again to make sure they are correct.

1. Air is (pollute, polluted) when it affects safety, comfort or health, or when it (prevents, preventing) people from using their property or community.

2. Two major (source, sources) of air pollution are industry and transportation.

3. The (damage, damages) from air pollution is estimated to cost each American about $65 a year.

4. Smog (smother, smothers) vegetation such as leaves, flowers, and food crops.

5. Polluted air (affect, affects) paint pigment causing it to discolor and peel.

6. Air pollution (discolor, discolors) textile dyes, (soil, soils) curtains, and (leaves, left) grime on everything.

7. Cattle have (die, died) from breathing polluted air.

8. Polluted air can (damage, damages) tire casings and can (weaken, weakens) leather, glass, and paper.

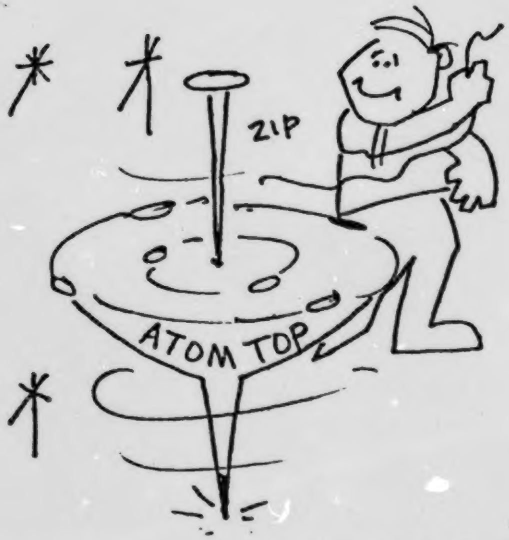
9. Air pollution can (cause, causes) higher electric light bills by blocking out the sun and darkening the day.

10. Polluted air is one of the major (cause, causes) of lung disease such as emphysema and lung cancer.

11. Headaches, dizziness, coughing, shortness of breath, irritated eyes, and chest pains can all be (relate, related) to polluted air.

12. Polluted air (is, are) expensive and dangerous for everyone.

Name ______________________________



DIRECTIONS: These words that are associated with nuclear energy are hidden in the sentences below. Find the words and draw a circle around them.

WASTE RADIOACTIVE FUSION CORE

REACTOR BREEDER FISSION ATOMIC

STORAGE

1. Joe and Bill are actors in the school play.
2. Sally thought the cause of the damage was termites.
3. Have you heard the new radio act I've made up?
4. It had better be terrific or Ed will have to look for a new job.
5. Since there were three of us, I only needed fifty cents.
6. Give a banana to Michael, please.
7. When the coke went 'fiss', I only lost half of it.
8. Did Bob Reed erase the board?
9. Did you buy a daisy first or a geranium?

Write the words in the correct column. Divide them into syllables.

One syllable

____

____

Two syllables

____

____

____

____

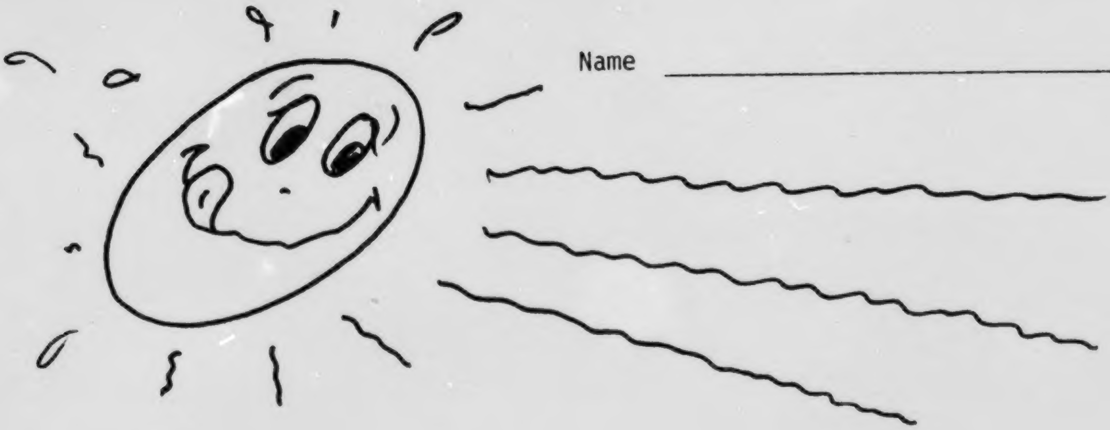
Three syllables

____

____

Five syllables

____



Name ______________________________

We know that most of the energy we use today comes originally from the sun. Put numbers in front of the following sentences to show the order in which they happen.

Fossil Fuel Energy

____ Heat and pressure over a long period of time change decaying plants and animals into coal, oil, and natural gas

1. Light and heat from the sun provide life materials for growing plants and animals.

____ Fossil fuels are refined to provide energy for machinery.

____ Plants and animals die and decay.

____ Man drills wells and digs deep into the earth to uncover fossil fuels.

Hydroelectric Energy

____ Turbines generate electricity for power.

____ Rain falls and fills rivers and streams.

____ Heat from the sun evaporates water from oceans and lakes.

____ Evaporated water forms rain clouds.

____ Dams on rivers trap water and use water flow to turn turbines.

Wind Energy

____ Heat from the sun warms the air.

____ Windmills can be used to pump water or generate electricity.

____ As warmed air rises, cold air fills its space causing wind currents.

____ Moving wind turns large blades on windmills.

Name ______________________

DIRECTIONS: On the line at the right of each sentence write the word that the underlined abbreviation stands for.

1. Environmental license plates are obtained through the Dept. of Motor Vehicles. ______________

2. The address of the National Audubon Society is 950 Third Ave., New York, New York. ______________

3. You can get free conservation materials from the U. S. Government Printing Office. ______________

4. The Sierra Club in Calif. is concerned with the protection of our environment. ______________

5. Some states, like Ore., have passed laws so that beer and soda can only be sold in returnable containers. ______________

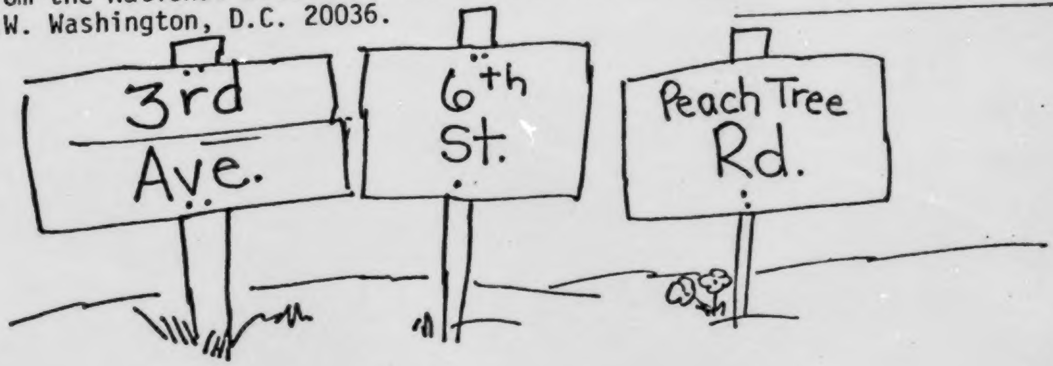
6. The first bikeway marked with signs was established in Homestead, Florida, in Aug. 1962. ______________

7. The Pres. of the United States gives a special award to students who organize and conduct environmental projects. ______________

8. Ecology Action Packs are available from McDonalds, P.O. Box 2344, Kettering, Ohio 45429. ______________

9. Dr. Seuss wrote a book about man's effect on his environment called "The Lorax". ______________

10. You can get information about endangered animals from the National Wildlife Federation, 1412 16th St., N.W. Washington, D.C. 20036. ______________



Name ______________________________

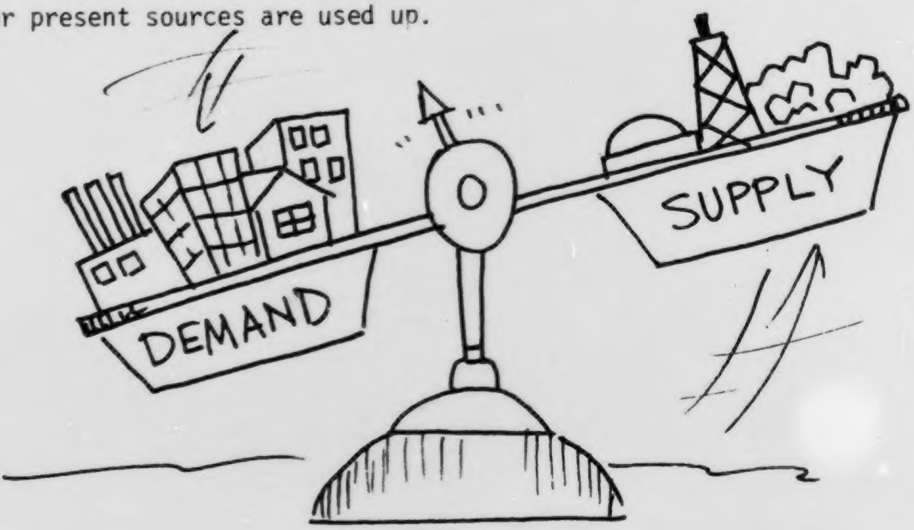
DIRECTIONS: Antonyms are words that have opposite meanings. Use the word box to write antonyms for the words in parentheses.

limited before conserve waste

more necessary future most

The Energy Balance - Supply and Demand

1. Today we are demanding even (less) ____________ power for industry, homes and transportation.
2. Energy is (needless) ________________________ to operate all our machines.
3. Fossil fuels, like coal and oil, are our (least) _______________ important sources of energy.
4. These fossil fuels are (everlasting) ______________________________.
5. We must not (save) ____________________ the amounts of fuels which are left.
6. Everyone should try to (waste) _______________________ energy whenever possible.
7. We also need to develop new sources of energy for the (past) ________________.
8. Our life style depends on finding these new sources (after) _________________ our present sources are used up.



Name ______________________________

DIRECTIONS: A fact is something known to be true or to have really happened. An opinion is something one thinks or believes.

Write Fact or Opinion in front of each of the following statements.

__________________ 1. The world's population is continuing to increase.

__________________ 2. In five years, there won't be enough food for everyone.

__________________ 3. Insects can destroy valuable food crops.

__________________ 4. The use of pesticides is the biggest problem in our environment.

__________________ 5. No one should ever use pesticides.

__________________ 6. Scientists are trying to develop alternate sources of energy.

__________________ 7. Nuclear energy is an alternative source of power.

__________________ 8. Solar energy is our best hope for the future.

__________________ 9. Wind power has been used for years.

__________________ 10. Solar heating is too expensive to use at this time.

__________________ 11. In ten years, there may not be any oil left.

__________________ 12. Gasoline is made from oil.

__________________ 13. The faster a car goes, the more gas it uses per mile.

__________________ 14. Geothermal power is better than hydroelectric power.

__________________ 15. Volcanoes are examples of geothermal power.

__________________ 16. If everyone would stop using electric toothbrushes, we would have enough extra electricity to last ten more years.

Name ________________________________

Airplanes are a form of mass transit. Although they carry large numbers of people, they also add dirt and waste gases into the air. This polluted air can easily be seen over airports as planes take off and land.

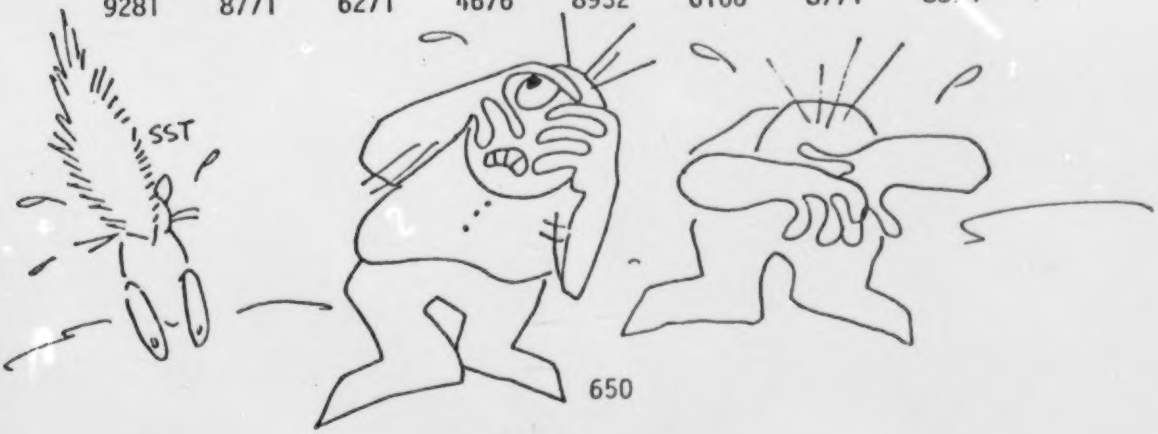
DIRECTIONS: Do the problems to answer the riddle at the bottom of the page.

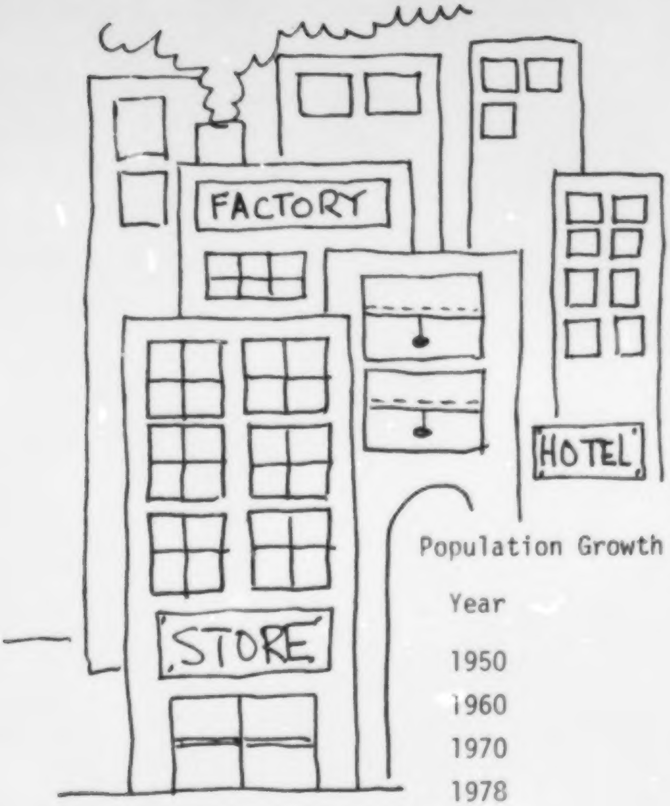
4823 + 1448 O	6198 + 2734 H	3866 + 5008 S	2967 + 3139 E	7403 + 1878 B
2455 + 6316 R	1198 + 3478 T	4119 + 3981 N	5025 + 1986 W	7342 + 1874 G

WHO INVENTED THE FIRST AIRPLANE THAT DIDN'T FLY?

_____ _____ _____   _____ _____ _____ _____ _____
4676 8932 6106   7011 8771 6271 8100 9216

_____ _____ _____ _____ _____ _____ _____ _____ !
9281 8771 6271 4676 8932 6106 8771 8874





Name ____________________________

Although growth in Santa Clara County has slowed somewhat in recent years, it is still one of the fastest growing areas in California and possibly in the country.

DIRECTIONS: Use the chart to answer the questions.

Population Growth of Santa Clara County

Year	Population Size
1950	291,000
1960	642,000
1970	1,065,000
1978	1,223,000

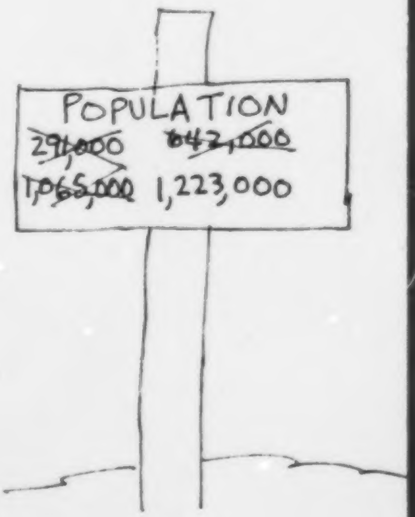
1. How many more people lived in Santa Clara County in 1960 than in 1950? ____________

2. How many more people lived in the County in 1970 than in 1960? ____________

3. How many more people were there in the County in 1978 than in 1970? ____________

4. How many more people lived in the County in 1978 as compared to 1950? ____________

5. Which ten year span had the greatest growth in population? ____________________________



Name ______________________________

We know that fossil fuels (oil, coal and natural gas) are a limited source of energy. The faster we use them, the sooner they will be gone. We need to find alternate sources of energy.

What are three sources of energy that are not fossil fuels?

DIRECTIONS: Find the answer by following the directions of each sentence.

On spaces numbered:

5 and 20 -- If 35 - 7 is the same as 20 + 8, put R. If not, put W.

8 and 13 -- If 3 X 5 is the same as 5 X 3, put D. If not, put I.

6 --- If 56 ÷ 8 is the same as 8 X 8, put O. If not, put T.

16 --- If 200 - 99 is the same as 10 + 1, put N. If not, put C.

3, 10 and 17 - If 26 + 26 is the same as 50 + 2, put L. If not, put A.

1 --- If 6 X 4 is the same as 3 X 8, put S. If not, put T.

7 --- If 99 ÷ 9 is the same as 9 + 1, put M. If not, put I.

12 and 14 -- If 4 X 5 is the same as 100 ÷ 5, put N. If not, put S.

2 --- If 3 + 1 is the same as 3 X 1, put A. If not, put O.

18 --- If 73 - 42 is the same as 23 + 8, put E. If not, put Y.

15 --- If 40 X 0 is the same as 5 X 0, put U. If not, put O.

4, 9, 11, 19 - If 100 ÷ 10 is the same as 980 - 970, put A. If not, put P.

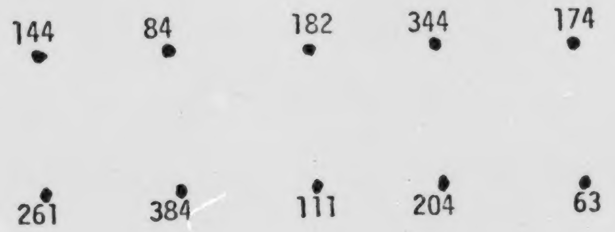
Three sources of energy that are not fossil fuels are:

___ ___ ___ ___ ___, ___ ___ ___ ___ ___, ___ ___ ___
1 2 3 4 5 6 7 8 9 10 11 12 13

___ ___ ___ ___ ___ ___ ___.
14 15 16 17 18 19 20

Name ______________________________

The last fossil fuel to be developed as an energy source was???
(We've only used it for the last 100 years!)



Find out . . .

Connect answer 4 with answer 5.
Connect answer 7 with answer 9.
Connect answer 3 with answer 8.
Connect answer 2 with answer 1.
Connect answer 1 with answer 5.
Connect answer 4 with answer 2.
Connect answer 9 with answer 6.

1. $18\overline{)6912}$	2. $92\overline{)7728}$	3. $36\overline{)6552}$
4. $55\overline{)7920}$	5. $34\overline{)8874}$	6. $74\overline{)4662}$
7. $26\overline{)8944}$	8. $62\overline{)6882}$	9. $43\overline{)8772}$

Name ______________________________

Many people object to nuclear energy because of the unsolved problem of what to do with the radioactive waste products. At the present time, these radioactive wastes are usually stored in thick lead boxes which are buried deep underground or dumped into the ocean.

These radioactive wastes are very dangerous and it takes a long time before they lose their radioactivity. The length of time it takes is measured in half-life. Each radioactive element has a different half-life.

An example of an element with a half-life of 10 years:

Original amount stored	- 20 pounds
Ten years later	10 pounds still radioactive
Ten years later	5 pounds still radioactive
Ten years later	2 ½ pounds still radioactive
Ten years later	1 ¼ pounds still radioactive

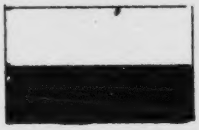
How many years will it take till 1 ¼ pounds of waste is still radioactive?

____

DIRECTIONS: The half-life of radium is 1600 years. Using this information, write the correct year next to each box.

RATE OF RADIOACTIVE DECAY - RADIUM

Radium stored in 1979

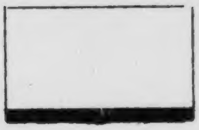


After 1600 years, half the radium atoms have broken down.

What year is it? ________________

After another 1600 years, half the radium atoms have broken down.

What year is it? ________________



After another 1600 years, half the radium atoms have broken down.

What year is it? ________________

Uranium, which is the radioactive element used to make nuclear energy, has a half-life of 700,000,000 years!

Name ______________________________

DIRECTIONS: Read the story. Use standard notation to answer the questions below.

Wildlife Preserves

Many years ago, people realized that something had to be done to protect animals and birds that were becoming endangered. Many of these animals were in trouble because man had built roads and cities where they lived. Our government passed tax laws to raise money in order to buy land where these animals could live safely. These wildlife preserves became permanent homes where wild animals are protected, and where they can find food and shelter and bear their young.

The Fish and Wildlife Service of the United States Department of the Interior is in charge of two hundred and sixty four National Wildlife Refuges with a total area of nine million five hundred forty six thousand six hundred and forty six acres. Seventeen additional refuges exist in Alaska, Hawaii and Puerto Rico. One hundred and ninety nine of the refuges are set up mainly for birds that live in or near water. Forty one are for birds not normally hunted. Seventeen are for big game animals. And six are for birds other than waterfowl.

These wildlife preserves have saved many animals that might have become extinct.

1. How many National Wildlife Refuges are there in the United States? __________
2. How many acres are being used for this purpose? ____________________
3. How many refuges exist in Alaska, Hawaii and Puerto Rico? ______________
4. How many refuges are used for birds that live in or near water? __________
5. How many refuges are for birds that are not normally hunted? __________
6. How many refuges are for big game animals? ________________

Name ______________________________

Roy and his friends are selling some of their old toys at a flea market. This is one way of recycling materials and preventing waste.

DIRECTIONS: Change the numbers to dollars and cents. Add up their sales.

Roy

A box of hot wheel cars=3 dimes, 1 nickle, 2 pennies $ .3 7
Hardy Boys game = 1 quarter, 1 nickle, 4 pennies
Puzzles = 1 dollar, 1 dime, 6 pennies
Darth Vader mask = 2 quarters, 6 pennies

Harold

Box of comic books = 1 dollar, 2 quarters, 1 nickle
Slightly used math book = 1 dime, 3 pennies
Lincoln log set = 1 quarter, 1 dime

John

1 fish bowl = 1 nickle, 4 pennies
53 guppies = 1 dollar, 4 dimes, 1 nickle
Bike wheel = 3 quarters, 1 dime
Barbie doll (his sister's) =6 dimes, 11 pennies

David

1 pair skates = 1 dollar, 1 quarter, 1 dime
6 baseball cards = 5 nickles, 5 pennies
Nerf football = 3 quarters, 2 dimes, 1 nickle

Who made the most money? ______________________________

Name ______________________________

The National Wildlife Federation has started a paper recycling program in their company offices. Each employee has a tray on their desk to hold used papers. The used papers go from the trays to boxes instead of into the wastebasket.

Their goal is to save four tons of used paper for recycling.

DIRECTIONS: Do the word problems below.

1. The NWF goal is to save four tons of used paper. Each box weighs 50 pounds when it is full. How many boxes will they need to make four tons?

2. Each 1000 pounds of paper that they collect will save 8.5 trees. If they reach their goal of four tons, how many trees will be saved?

3. The four tons of used paper will be recycled and made into copier paper. Recycling one ton of waste paper uses 22,000 kilowatt hours of energy. Producing the same amount of paper from trees takes 67,000 kilowatt hours. How many kilowatt hours of energy will be saved by recycling four tons of waste paper?

(This is enough to air condition and heat two average houses in Washington, D.C. for an entire year!)

Name ______________________

DIRECTIONS: Do the problems. Remember to reduce your answers to their lowest terms.

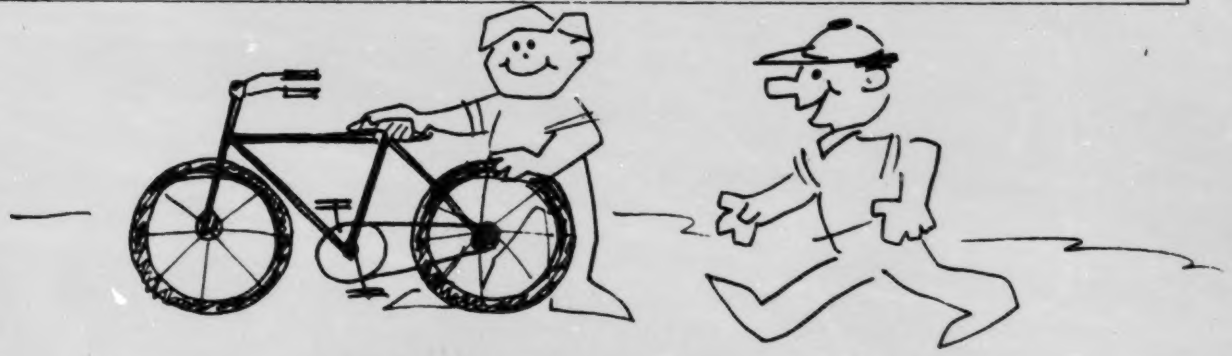
Use the code to find two methods of transportation that save energy and natural resources.

Code Box

$\frac{1}{2}$ = A	$\frac{1}{3}$ = B	$\frac{1}{4}$ = D	$\frac{2}{3}$ = I	$\frac{3}{4}$ = W	$\frac{3}{7}$ = N	$\frac{3}{5}$ = K
$\frac{1}{6}$ = M	1 = G	$\frac{4}{5}$ = E	$\frac{2}{5}$ = O	$\frac{5}{6}$ = R	$\frac{6}{7}$ = L	$\frac{1}{8}$ = P

$\frac{1}{6}$	$\frac{2}{12}$	$\frac{4}{10}$	$\frac{8}{20}$		$\frac{2}{6}$	$\frac{1}{6}$	$\frac{1}{8}$	$\frac{4}{9}$	$\frac{3}{14}$	$\frac{5}{20}$
$+\frac{1}{6}$	$+\frac{6}{12}$	$+\frac{2}{10}$	$+\frac{8}{20}$		$+\frac{3}{6}$	$+\frac{3}{6}$	$+\frac{1}{8}$	$+\frac{2}{9}$	$+\frac{3}{14}$	$+\frac{15}{20}$
1/3										
B										

$\frac{1}{4}$	$\frac{1}{7}$	$\frac{1}{12}$		$\frac{4}{8}$	$\frac{1}{10}$	$\frac{2}{7}$	$\frac{4}{10}$	$\frac{7}{15}$	$\frac{2}{21}$	$\frac{3}{4}$
$+\frac{1}{4}$	$+\frac{2}{7}$	$+\frac{2}{12}$		$+\frac{2}{8}$	$+\frac{4}{10}$	$+\frac{4}{7}$	$+\frac{2}{10}$	$+\frac{3}{15}$	$+\frac{7}{21}$	$+\frac{1}{4}$



Name ______________________________

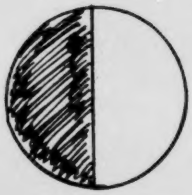
In California, the largest source of air pollution is the automobile.

The California State Air Resources Board has adopted many new requirements which will reduce air pollution and also improve car mileage.

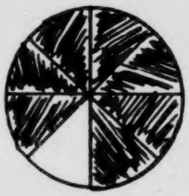
California requires smoy control devices on all automobiles sold in the state. It is the first state to do so.

Car manufacturers are also trying to improve cars so that they are less polluting and don't use as much gasoline. Some Volkswagen cars, for example, can go almost 50 miles on one gallon of fuel.

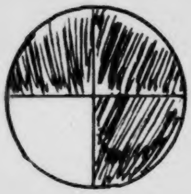
DIRECTIONS: What part of the whole figure is shaded? Use your answers to solve the riddle.



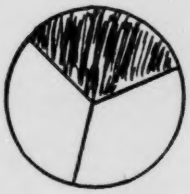
___ = O



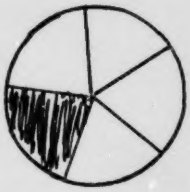
___ = H



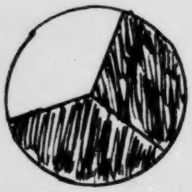
___ = D



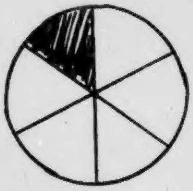
___ = E



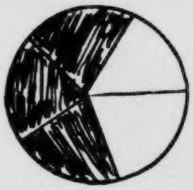
___ = L



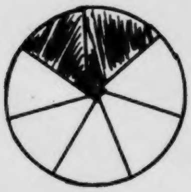
___ = K



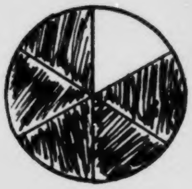
___ = S



___ = M



___ = V



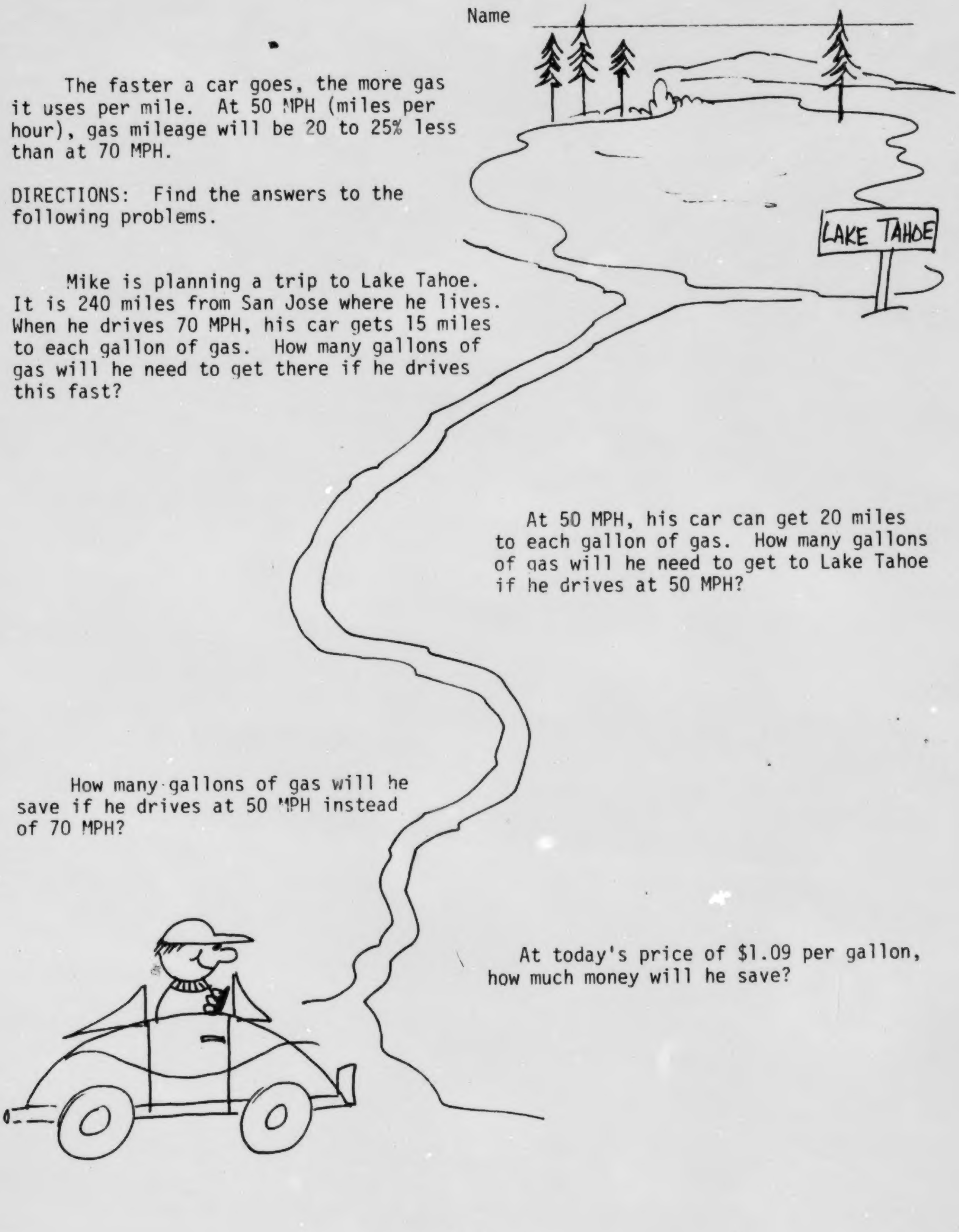
___ = T

WHERE DO OLD VOLKSWAGENS GO?

$\frac{5}{6}$ $\frac{1}{2}$ $\frac{5}{6}$ $\frac{7}{8}$ $\frac{1}{3}$ $\frac{1}{2}$ $\frac{1}{5}$ $\frac{3}{4}$

$\frac{2}{7}$ $\frac{1}{2}$ $\frac{1}{5}$ $\frac{2}{3}$ $\frac{1}{6}$ $\frac{7}{8}$ $\frac{1}{2}$ $\frac{3}{5}$ $\frac{1}{3}$

Name ____________________



The faster a car goes, the more gas it uses per mile. At 50 MPH (miles per hour), gas mileage will be 20 to 25% less than at 70 MPH.

DIRECTIONS: Find the answers to the following problems.

Mike is planning a trip to Lake Tahoe. It is 240 miles from San Jose where he lives. When he drives 70 MPH, his car gets 15 miles to each gallon of gas. How many gallons of gas will he need to get there if he drives this fast?

At 50 MPH, his car can get 20 miles to each gallon of gas. How many gallons of gas will he need to get to Lake Tahoe if he drives at 50 MPH?

How many gallons of gas will he save if he drives at 50 MPH instead of 70 MPH?

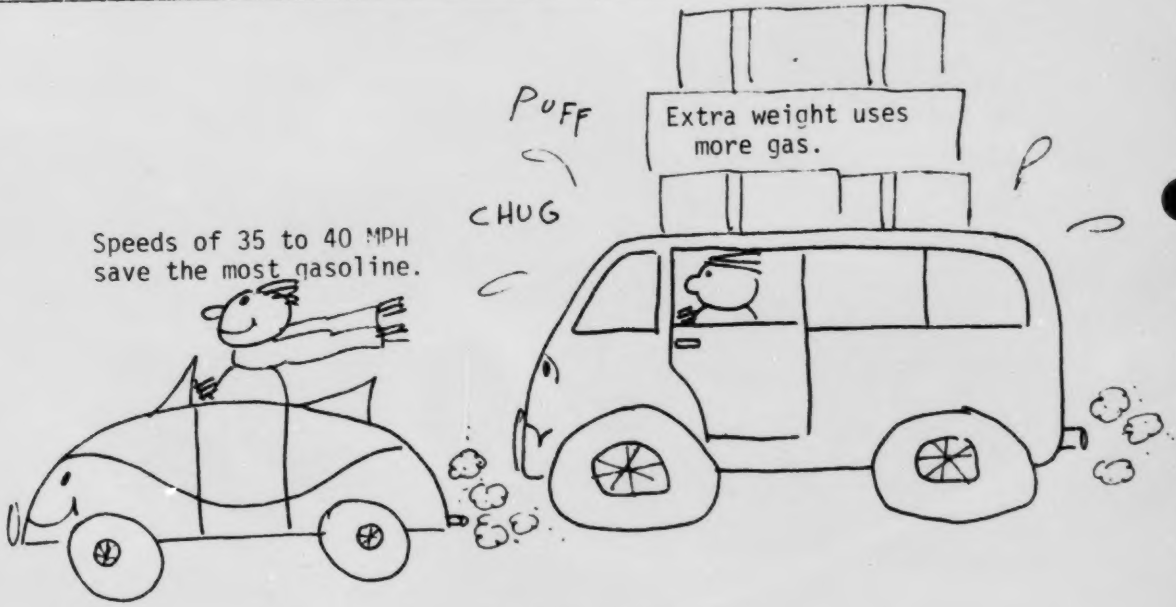
At today's price of $1.09 per gallon, how much money will he save?

Name ______________________________

Twenty-five percent of all the energy used in the United States goes for transportation. This is ¼ of all our energy needs!

DIRECTIONS: Reduce the fractions to their lowest terms. Use your answers to solve the riddle.

$\frac{6}{8}$ = ____ = N	$\frac{4}{24}$ = ____ = R	$\frac{2}{6}$ = ____ = H	$\frac{2}{18}$ = ____ = Y
$\frac{4}{6}$ = ____ = A	$\frac{1}{15}$ = ____ = P	$\frac{3}{6}$ = ____ = O	$\frac{12}{20}$ = ____ = T
$\frac{4}{10}$ = ____ = G	$\frac{2}{8}$ = ____ = I	$\frac{10}{100}$ = ____ = U	$\frac{6}{6}$ = ____ = B


PUFF
Extra weight uses more gas.
P
CHUG
Speeds of 35 to 40 MPH save the most gasoline.

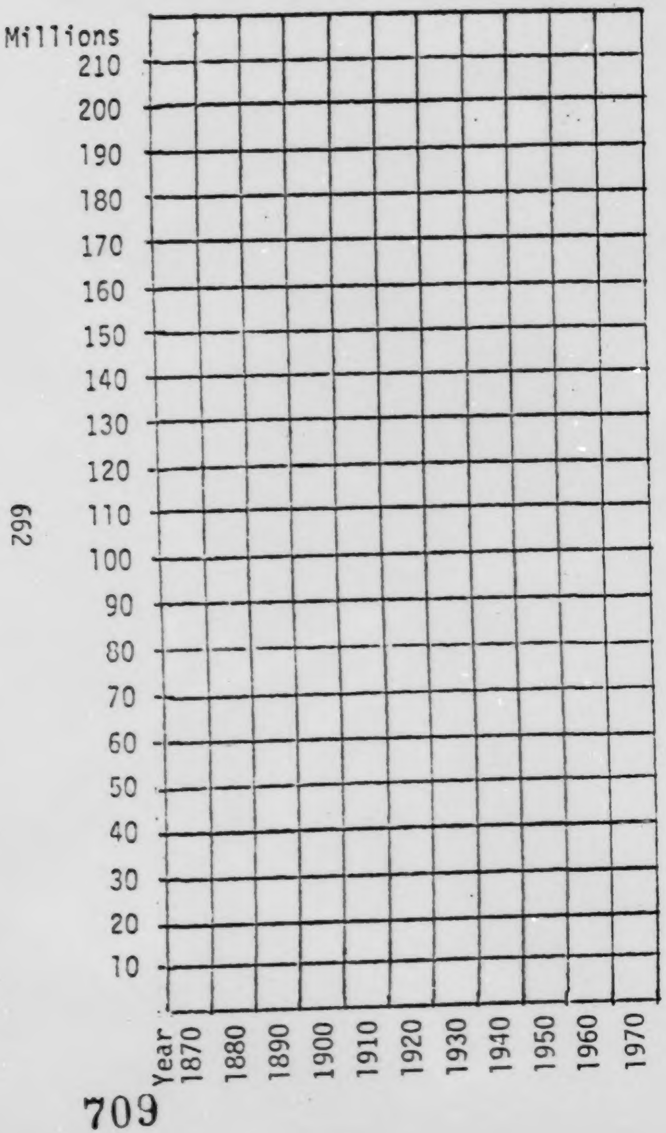
WHAT IS A HISTORY OF CARS CALLED?

___ ___   ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

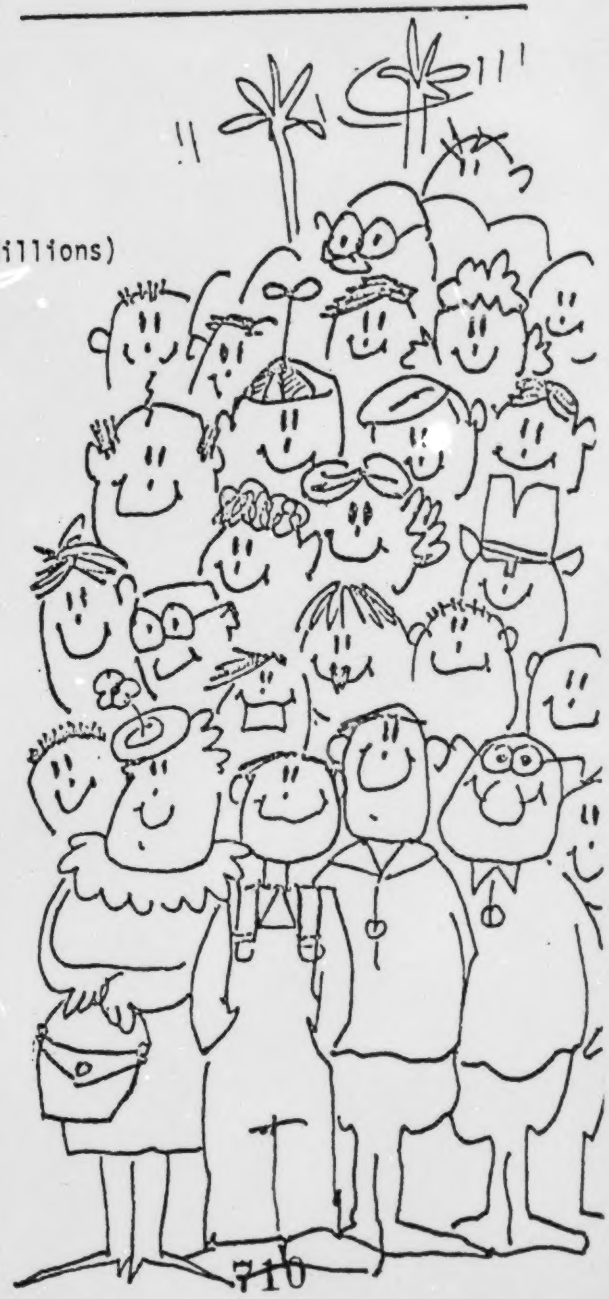
$\frac{2}{3}$ $\frac{3}{4}$ $\frac{2}{3}$ $\frac{1}{10}$ $\frac{3}{5}$ $\frac{1}{2}$ 1 $\frac{1}{4}$ $\frac{1}{2}$ $\frac{2}{5}$ $\frac{1}{6}$ $\frac{2}{3}$ $\frac{1}{15}$ $\frac{1}{3}$ $\frac{1}{9}$

Name ______________________________

Use the table to make a bar graph of the population growth in the United States from 1870 to 1970.



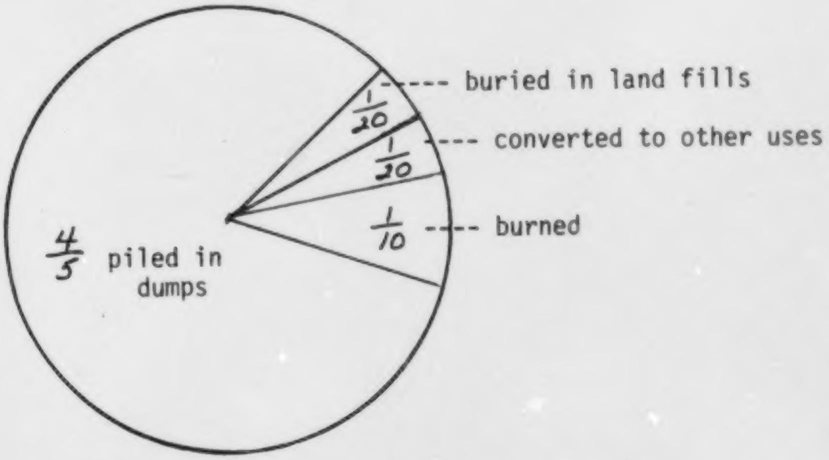
Year	Population (Millions)
1870	38.6
1880	50.2
1890	62.9
1900	76.0
1910	92.0
1920	105.7
1930	122.7
1940	131.7
1950	150.7
1960	178.5
1970	203.1



Name ______________________________

Each one of us in the United States throws away almost one ton of trash a year. This adds up to more than 360,000,000 tons of trash a year in the United States.

The circle graph below shows what happens to all this trash.



DIRECTIONS: Use the circle graph to fill in the blank spaces. Write your answers as percentages.

Where Does All the Trash Go?

_____% is piled in dumps.

_______ is burned.

_______ is buried in land fills.

_______ is converted to other uses (including recycling).

Name ______________________________

Matt has discovered a new book called Free Stuff for Kids. It has hundreds of things listed that kids can send for by mail.

Matt has written the addresses in expanded notation. Unfortunately, the post office will not accept mail addressed like this.

DIRECTIONS: Change the numbers in the addresses to standard numerals. Write the corrected part of the address on the blank space.

1. The World Wildlife Fund is working to save wild animals from extinction. If you write to them, they will send you a free panda decal, penquin postcard and animal poster. Their address is:

World Wildlife Fund
Department LAN
One thousand six hundred and one Connecticut Ave. N.W.

____

Washington, D.C. Twenty thousand and nine

____

2. If you would like to recycle plastic containers and make fun things at the same time, write to the TEXIZE company for their Crafty Critters Folder. Their address is:

Consumers Relations Department
Box RB
TEXIZE
P.O. Box three hundred and sixty eight

____

Greenville, SC Twenty nine thousand six hundred and two

____

3. You can help save the world's natural resources by recycling aluminum cans and TV dinner trays. Reynolds Aluminum Company will send you a colorful comic book that tells you how sell the used aluminum containers back to them. Write to:

Recycling Public Relations Manager
Reynolds Metals Company
Box twenty seven thousand and three

____

Richmond, VA Twenty three thousand two hundred sixty one

____

Name ______________________________

Transportation is a big problem in our environment. Today, in the United States, transportation uses 25% of all our energy. In California, automobiles are the number one source of air pollution. New highways and roads often result in loss of habitats for wild animals and plants.

Some people think that mass transportation is the answer. Trains and buses don't pollute the air as much as cars do. They use less fuel to carry more people and don't require as much space.

DIRECTIONS: Read the following. Answer the questions.

. One railroad track can carry 72,000 people in one hour. A 3-lane highway can carry 6,000 people in one hour, if each car has 6 people in it.

1. How many people can a 3-lane highway carry in one hour if each car has only one person in it?

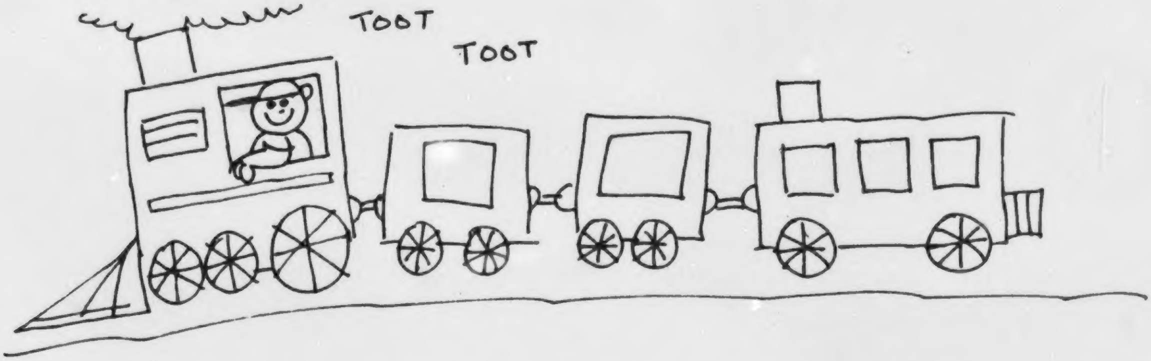
   ____

2. How many more people per hour can the railroad track carry than the 3-lane highway (with 6 people in each car)?

   ____

3. How many more people per hour can the railroad track carry than the 3-lane highway (with only 1 person in each car)?

   ____



4. You are the engineer on a train going from San Jose to New York. The trip will cover 4000 miles. There are 542 passengers on the train when it leaves San Jose. The train is going to make four stops on the way. At each stop, 50 people will get off and 75 people will get on the train. Use this information to find out 'how old the engineer is'.

The engineer is ____________ years old. 713

Name ______________________________

This chart compares three kinds of transportation -- planes, cars, and trains. The plane and train are each carrying 360 people. With 4 people in each car, 90 cars will also carry 360 people. Everyone is traveling 500 miles. The last column shows how much fuel the plane, train, and cars need.

Kind of Transportation	Miles Traveled	Number of Passengers	Gallons of fuel
1 plane	500 miles	360 people	3,911 gallons
90 cars	500 miles	360 people	3,316 gallons
1 train	500 miles	360 people	1,238 gallons

DIRECTIONS: Figure out how much fuel each person uses when he travels by plane, train, or car. You can do this by dividing the number of people into the number of gallons each kind of transportation uses.

1. Traveling by plane?

2. Traveling by car?

3. Traveling by train?

4. Traveling by cars carrying only 2 people in each car?

Which kind of transportation uses the least fuel? ______________________________

Which kind of transportation uses the most fuel? ______________________________

Name ____________________

In 1972, the government passed the Water Pollution Control Act Amendments which set standards for the quality of water. It means that industries and cities must be sure that water is free of pollutants before it is returned to rivers or lakes. This is one thing the government has done to protect the environment.

DIRECTIONS: Do the problems to solve the riddle.

Y= 3.340 + .66 = __________

H= 1.789 - .289 = __________

K= .05 X 3 = __________

G= 1 - .05 = __________

F= .50 + .50 = __________

N= .98 + 4.02 = __________

S= 1 - .99 = __________

M= .50 X 6 = __________

I= 3 ÷ 1.5 = __________

C= .14 + .6 = __________

P= .15 X 5 = __________

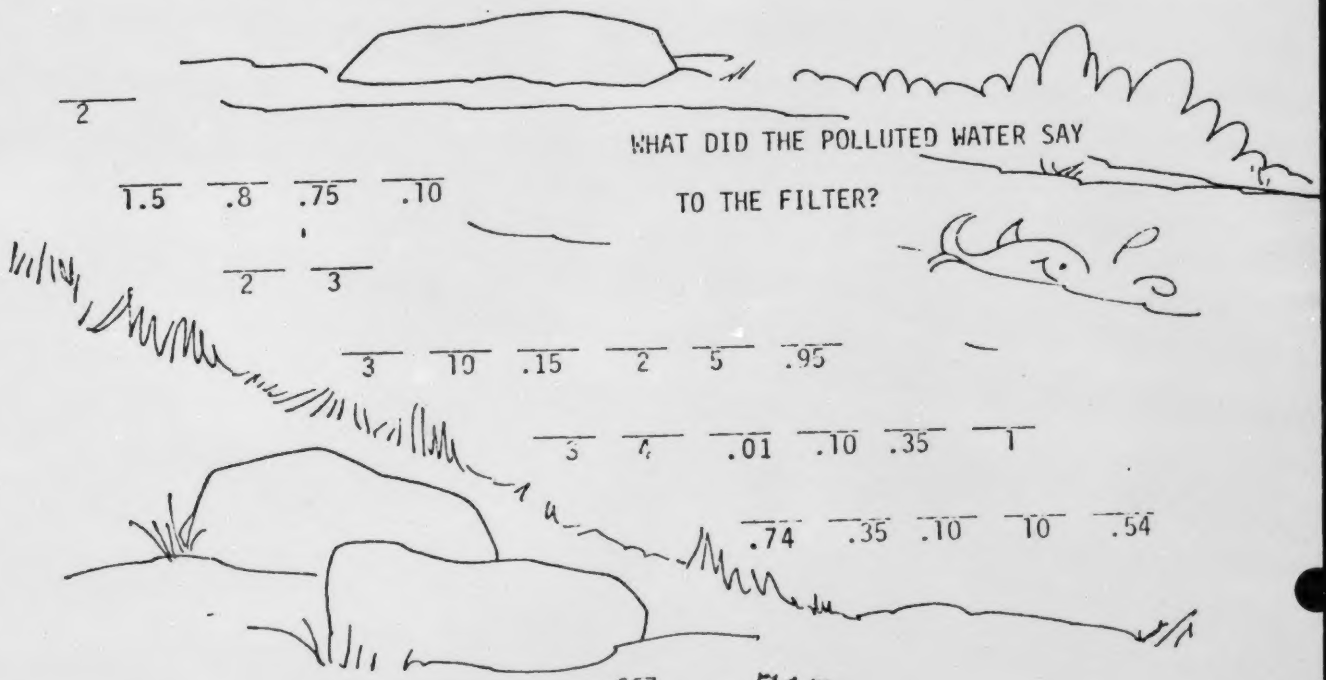
E= .04 + .06 = __________

L= .75 - .4 = __________

O= .33 + .47 = __________

A= 50 X .2 = __________

R= .628 - .038 = __________



WHAT DID THE POLLUTED WATER SAY

TO THE FILTER?

___
2

___ ___ ___ ___
1.5 .8 .75 .10

___ ' ___
2 3

___ ___ ___ ___ ___ ___
3 10 .15 2 5 .95

___ ___ ___ ___ ___ ___
3 4 .01 .10 .35 1

___ ___ ___ ___ ___
.74 .35 .10 10 .54

Name ______________________________

Many people do not understand what the energy crisis is all about. A recent study of 1,300 adults between the ages of 26 and 35 showed the following results.

DIRECTIONS: Find out how many people the percentages represent. First, change the percents to decimals. Then, multiply by 1,300 which is the actual number of people who answered the questions.

1. Only 46% of the people knew that crude oil produced the largest amount of energy used in the United States. How many people knew this?

46% = .46

$$\begin{array}{r} 1300 \\ \times\ .46 \\ \hline \end{array}$$

__________ people knew that crude oil produced the largest amount of energy.

2. Only 14% of the people knew that coal is the main fuel source used to produce electricity. How many people knew this?

__________ people knew that coal is the fuel used most to produce electricity.

3. Just 16% of the people knew that gasoline can be made from coal as well as oil. How many people was that?

__________ people knew that gasoline can be made from coal.

4. Only 49% of the people knew that the fossil fuel we have the most of is coal. How many people knew this?

__________ people knew that coal is the largest reserve of fossil fuels.

5. Only 33% realized that Americans, who make up 6% of the world's population, use more than 30% of its energy. How many people realized this?

__________ people were aware that we use this much energy.

Name ______________________________

In January 1978 the Bureau of Land Management published the results of a survey regarding the California desert lands. The survey asked people what they thought the California desert lands should be used for. Here are the results.

Idea	People in Favor
1. Places for use of off road vehicles like dune buggies and motorcycles	23%
2. Campgrounds	47%
3. Motels and restaurants	16%
4. Recreation such as amusement parks and sports facilities	30%
5. Mining	15%
6. Educational programs	46%
7. Protection of desert life and ecology	81%
8. Protection of areas of historic importance	67%
9. Protection of desert scenery and character	73%
10. Energy development (gas, oil wells, geothermal, solar)	45%

DIRECTIONS: List the ideas in the order that most people wanted.

1. ______________________________

2. ______________________________

3. ______________________________

4. ______________________________

5. ______________________________

6. ______________________________

7. ______________________________

8. ______________________________

9. ______________________________

10. ______________________________

Name ______________________________

Solar Energy

The energy from the sun can be used as an alternative source of power. The sun's energy comes to the earth in the form of light and heat. The sun's warmth can heat our homes, water, and even make electricity.

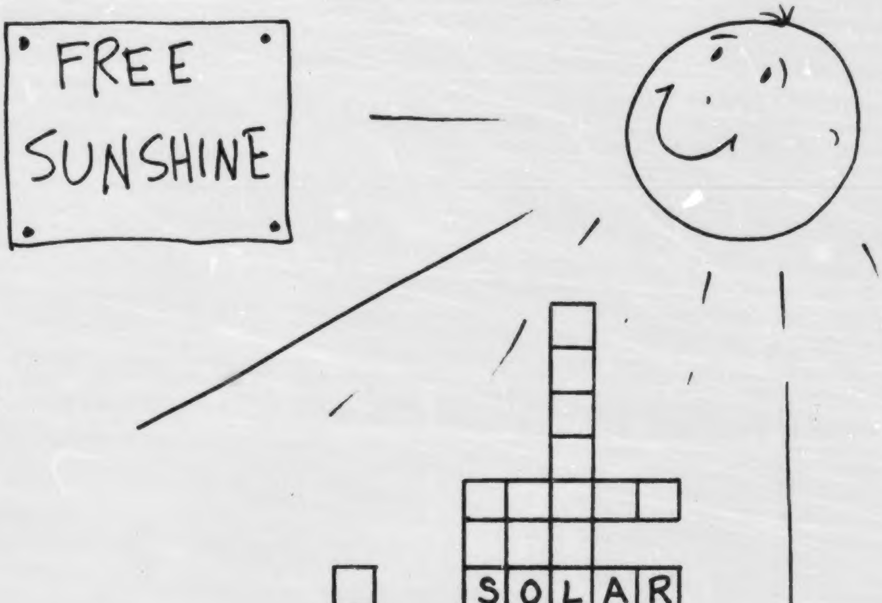
There are two basic types of solar energy used in the home. One is called 'passive'. The other is called 'active'.

A passive solar system is usually one where the sun's heat is used alone to heat water or living space. The sun's rays may shine through a window to warm a room or on collectors to heat water. Pumps and other mechanical equipment are not needed.

An active solar system uses another energy resource in addition to the heat from the sun. This other energy source is usually used to power pumps or other equipment to help move the heat or warmed water through the house.

DIRECTIONS: Fit these words associated with solar energy into the puzzle spaces below. Counting the letters and spaces will help to complete the puzzle.

SUN
HEAT
SOLAR
PUMPS
SYSTEM
ACTIVE
PASSIVE
STORAGE
THERMAL
EXCHANGER
COLLECTOR
INSULATION

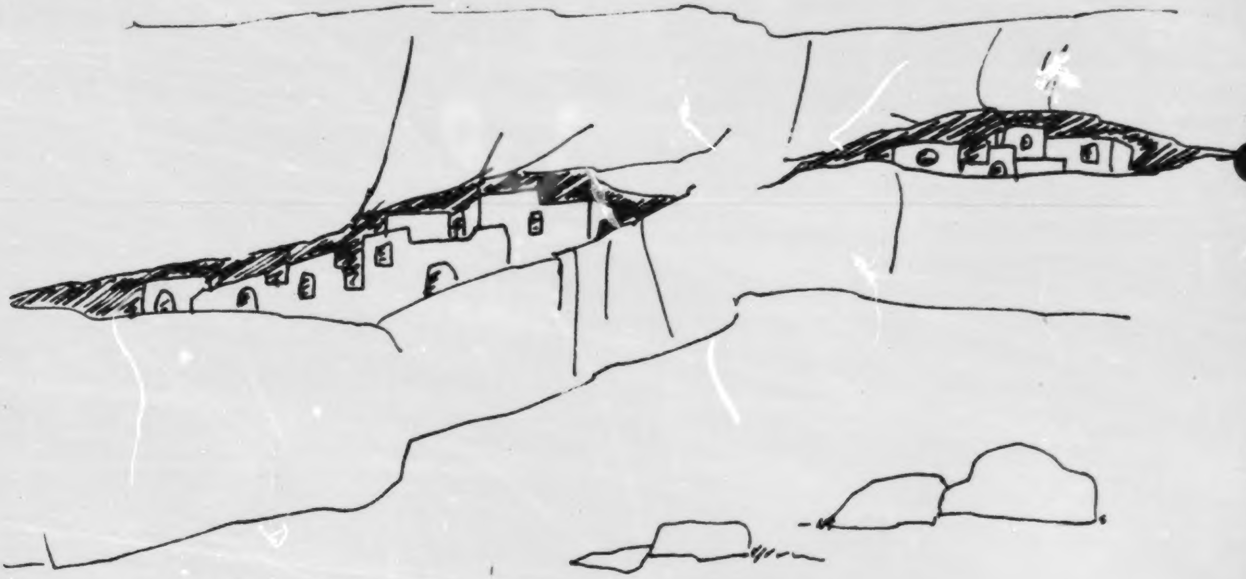


Name ____

The History of Solar Energy

The sun's energy has been used for heating and cooling for thousands of years. The early Greeks in the 5th century B.C. built entire cities facing south to take advantage of the sun's warming rays. A good example of early solar heating is in Mesa Verde, Colorado, where the Indians built their adobe homes in the cliffs of the mesa facing south. During the winter the sun would shine directly into the cliff dwellings and warm them naturally. The thick adobe walls stored the heat of the day. At night the stored heat would continue to keep the living space warm. During the summer when the sun was high, the overhanging cliffs shaded the structures to keep them cool. The Indians of Mesa Verde built their homes about 1200 A.D. Today, almost 800 years later, their natural heating and cooling system is still working.

In the early 1900's, fossil fuels and electricity were new kinds of energy used to provide heat for homes. When they were first used, they were very expensive, even more than they are today. Sunlight, on the other hand, was free. Solar water heating systems were introduced in California in 1891. The early models were simply shallow water tanks mounted on the roof of the house with plumbing leading to the kitchen and bathroom. In 1930, many rooftops in Los Angeles and other southern California cities had solar collectors. But as electricity, natural gas, and other fossil fuels became more readily available and dropped in price, the use of solar energy declined.



DIRECTIONS: Circle 'true' or 'false' for each statement.

1. Solar energy is a new source of power. True False

2. The sun can be used to heat houses. True False

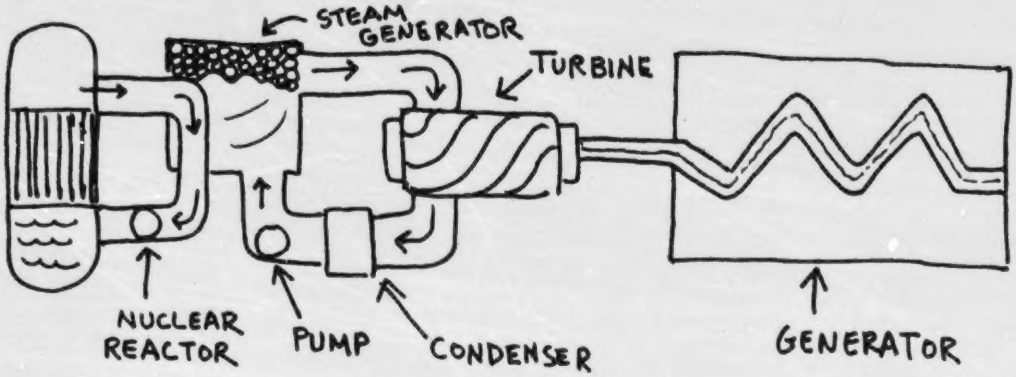
3. Fossil fuels were expensive when they were first used. True False

4. People stopped using solar power because it was too expensive. True False

Name ______________________________

Nuclear Energy

Nuclear energy is a source of power which does not depend on fossil fuels. Here's how a nuclear power plant works.



The nuclear fuel (uranium 235) gives off heat which creates steam. The steam turns turbines which generate electricity.

Here are some reasons why people think this is a good source of energy.

- Nuclear power plants work on a small amount of fuel. One pound of nuclear fuel (uranium 235) the size of a golf ball can create as much energy as 1,500 tons of coal. Fuel transportation costs are minimum.

- Nuclear fuel is a clean source of energy. Because it does not burn, there is no smoke, soot or sulfur fumes to add to our air pollution problem.

- Nuclear fuel has only one use - to produce electricity. Oil, natural gas, and coal are used to produce many other products such as plastics and fertilizers. We should save these fuels for purposes for which there are no substitutes.

There are more arguments over the use of nuclear power than any other energy source. Do you know why?

DIRECTIONS: Use the story to fill in the blank spaces.

1. The fuel for nuclear power plants is ______________________________.
2. The fuel heats water to make ______________________.
3. Steam turns ________________________ which generate electricity.
4. Nuclear power does not cause air ______________________________.
5. Fossil fuels are needed to produce products such as ____________________ and ______________________________.

Name ______________________________

Alternate Sources of Energy

Here are seven kinds of energy which do not depend on fossil fuels.

solar tidal hydro wind

nuclear fission geothermal fusion

DIRECTIONS: Write the correct word on the space in front of each description.

____________________ Used for hundreds of years. In areas where there are steady breezes, modern windmills can generate huge amounts of power. Free, quiet, and nonpolluting.

____________________ Steam or boiling water is produced when water deep in the earth seeps over very hot rocks. Limited to areas where volcano-earthquake belts are found.

____________________ Unlike nuclear fission, uses no radioactive materials which could be used to make weapons. Cheap raw materials are found in seawater. Needs much scientific research.

____________________ Nonpolluting, no noise and no waste. The sun's natural energy provides heat and light.

____________________ Created by the rise and fall of ocean waters. As tides change, water trapped in bays and reservoirs can be used to create electricity.

____________________ Converts atomic energy into usable power. Heat produced in reactors powers turbines. Many problems in getting rid of radioactive waste materials.

____________________ Electricity produced by generators which are powered by rushing or falling water. Many dams have been built on fast moving rivers to produce power.

Name ______________________________

SAVE
CONSERVE
N-R-G
I SAVE. DO YOU?

The Supply and Demand Problem

We know that the earth's supply of fossil fuels is limited. There is only so much coal, oil, and natural gas in the ground.

The problem is that we are using (demanding) more fossil fuels than we can produce (supply). It is estimated that the world will need as much oil in the next ten years as it has used in the last hundred.

Here in the United States, we already use more oil than we can produce. This means we must depend on other countries to supply our needs. We rely heavily on oil for gasoline, plastics, chemical products, and as the main energy source to produce electricity.

Many people are trying to solve this problem. Some are looking for new places to find oil. Others are trying to discover alternate sources of energy such as solar, hydro, wind, and nuclear power. We can all help by conserving the fossil fuels that we have. Using energy wisely will help to save these natural resources.

DIRECTIONS: Read the following facts. Use the back of your paper to answer the questions.

1. If everybody in America washed clothes in warm or cold water instead of hot, 100,000 barrels of oil could be saved daily.

   How can washing clothes in cold water save oil?

2. In one month a television set uses the same amount of oil that it takes to make one gallon of gasoline.

   How can not using your television set save oil?

Name ______________________________

The Energy Balance

The energy sources we're using today are limited, and we're using them up fast. If we want them to last until we develop new sources, we have to conserve what we have. There must be a balance between what we have and what we use. This is the energy balance of supply and demand. The supply is all the sources of energy we have now. The demand is all the things that use energy.

DIRECTIONS: Read the statements below.
If the statement affects the supply of energy, write S.
If the statement affects the demand of energy, write D.

____ 1. Off shore drilling increases oil production.

____ 2. Most families watch television about four hours a day.

____ 3. Windmills are being used to generate electricity in many areas.

____ 4. Five hundred new homes being built in foothills.

____ 5. Strip mining for coal outlawed in many States.

____ 6. Electric tooth brushes gain in popularity.

____ 7. Average American family now owns two cars.

____ 8. Alaskan pipeline carries oil from Alaska to continental United States.

____ 9. New department store is completely air conditioned.

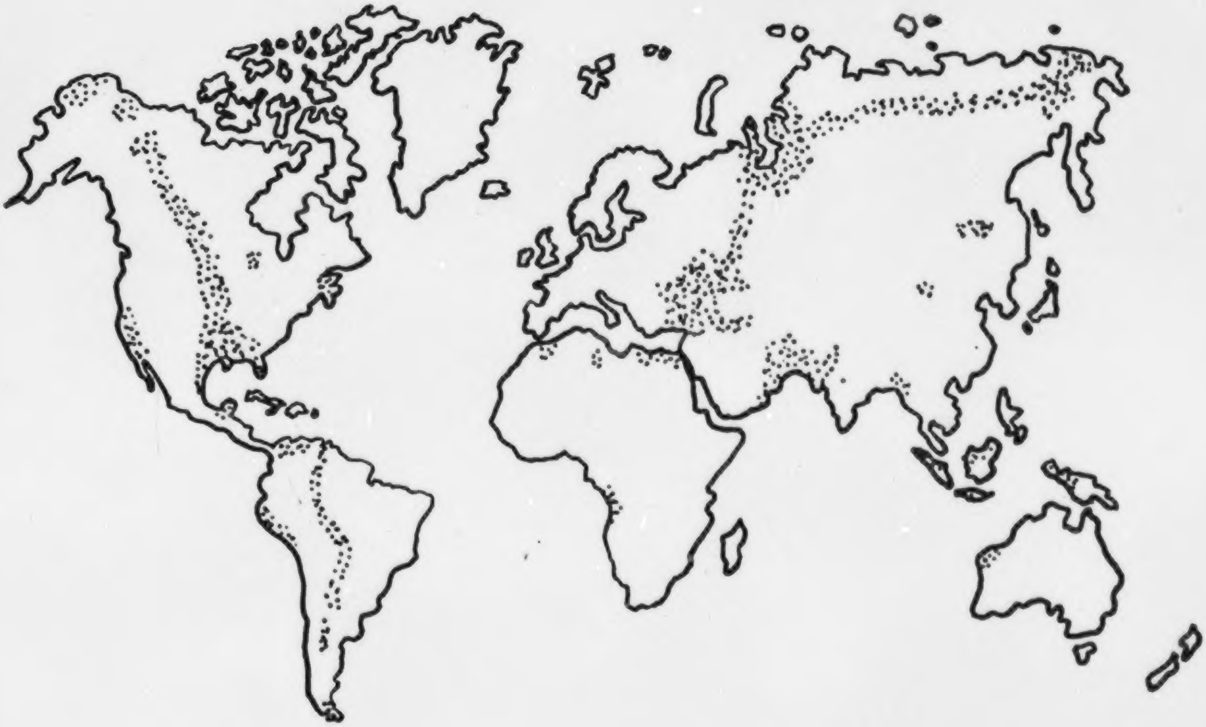
____ 10. Experts predict we will run out of natural gas in less than thirty years.

Cross out the things below that are users of (demand) energy.

refrigerator
sun
television set
elevator
automobile
light bulb
water
silver
coal
air conditioner
stove
train
vacuum cleaner
radio
airplane
telephone

723

Name ______________________________



⁙ = Oil producing areas

DIRECTIONS: Write the names on the continents.
Use the map to answer the questions.

1. What is the name of the large island that is not a continent?

____

2. What small continent has very little oil?

____

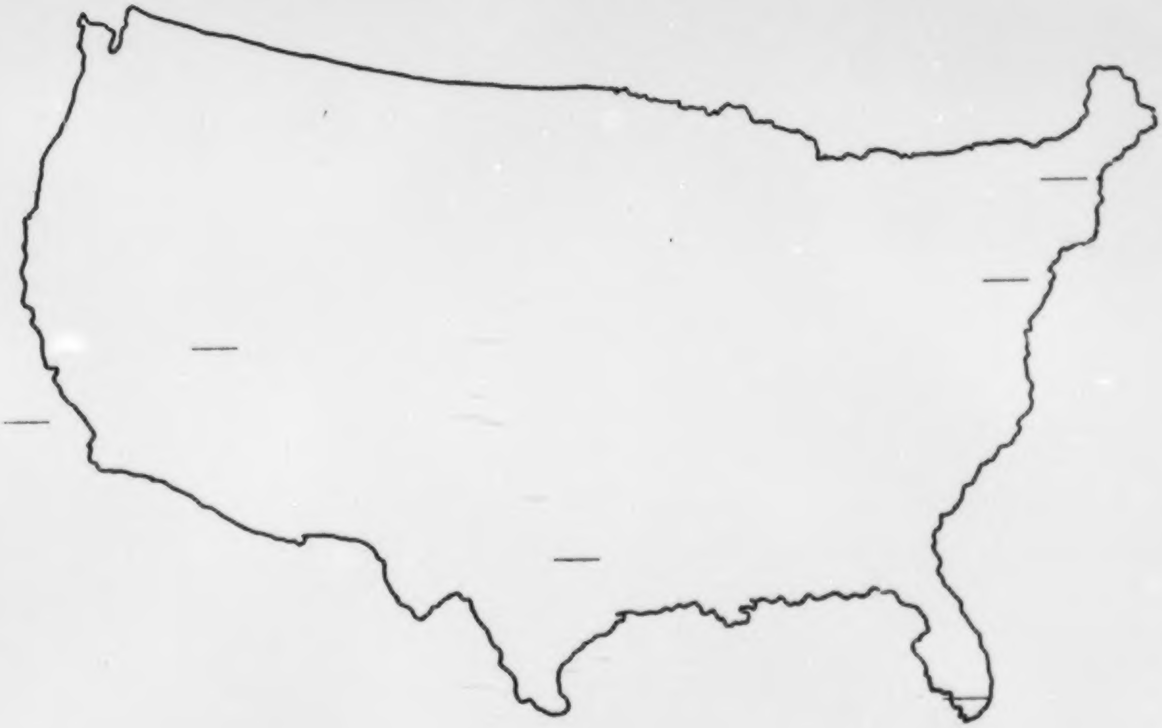
3. Which continents produce the most oil?

____

4. Between North and South America, which produces more oil?

____

Name ______________________



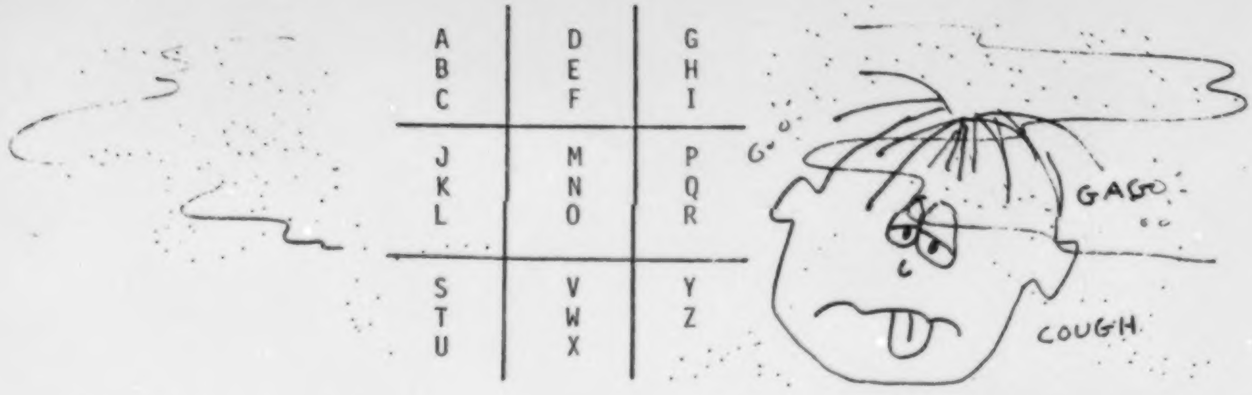
Pollution is caused by people.
When we pollute the air, water, or land, we are endangering ourselves and all other living things.

There is more pollution in cities than in the country. Do you know why?

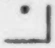
DIRECTIONS: Here are some pollution problems that are happening in cities in the United States. Number the spaces on the map to show where these problems are located.

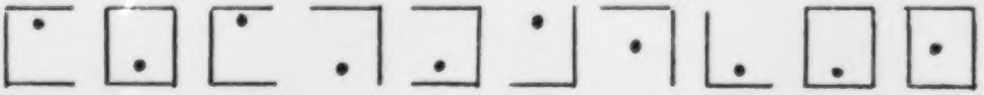
1. Oil spills have ruined many beaches off the shores of California.
2. Getting rid of garbage is a big problem for New York City.
3. Airplane exhaust is responsible for air pollution in Dallas, Texas.
4. Nuclear waste materials have been discovered in the air near atomic test sights in Nevada.
5. Water pollution due to factory dumping of pollutants into rivers is a problem in New Hampshire.
6. Signs and billboards are a visual pollution problem for Miami, Florida.

Name ______________________________

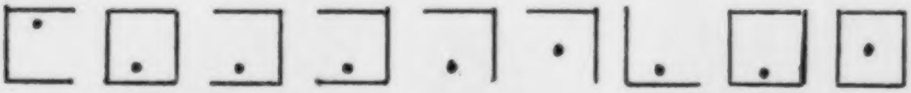


A B C	D E F	G H I
J K L	M N O	P Q R
S T U	V W X	Y Z

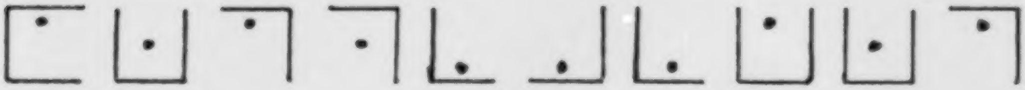
DIRECTIONS: Use this code to find three environmental problems of today. Look at the shapes and positions of the letters. For example: A= 



___ ___ ___ ___ ___ ___ ___ ___ ___ ___



___ ___ ___ ___ ___ ___ ___ ___ ___



___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Name ______________________________

Population Problems

People have discovered ways to avoid the natural controls of population.

They have killed or chased away larger animals that were a threat to them.

People have discovered medicines that can cure deadly diseases.

They have also learned to greatly increase their food supply through farming. Pesticides have helped to increase food production.

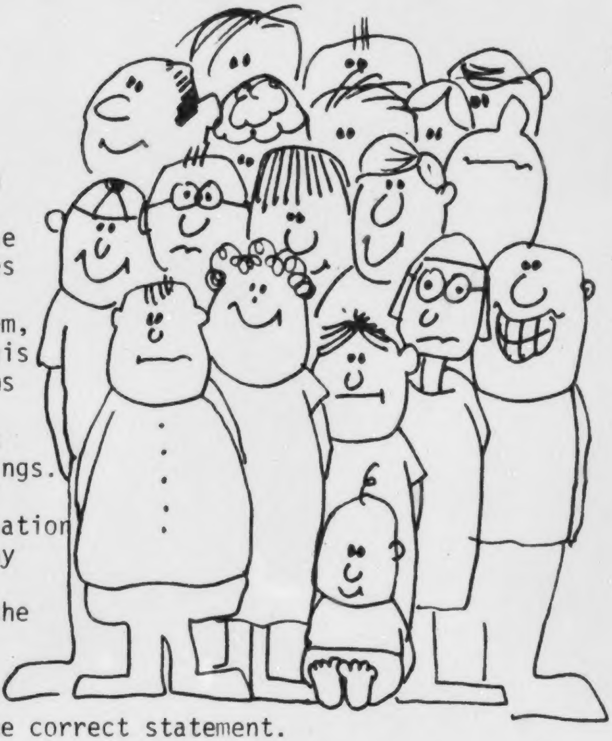
By controlling the environment around them, people have caused a population explosion. This increasing population is causing many problems for our environment.

More people are polluting the environment which we must share with all other living things.

People are finding it harder to produce enough food to keep up with the growing populatio

Land space is becoming overcrowded in many cities.

People are beginning to understand that the Earth's resources are limited and that the population cannot keep increasing forever.



DIRECTIONS: Write these words in front of the correct statement.

overcrowding　　pesticides　　environment

ecology　　limited　　population

________________________________ The number of people living in a certain place at a certain time

________________________________ What man has learned to control.

________________________________ What growing populations cause in cities.

________________________________ These have helped people to increase food production.

________________________________ What the Earth's resources are.

________________________________ The study of the relationships between living things and their environment.

If you write the first letter of each word, you will find out who causes population growth.

727

____

Name ______________________________

4.5 BILLION?
EEK!

The Population Problem

At 11:45 a.m. March 14, 1980, the world population passed 4.5 billion. This number was flashed over a special clock located in Washington, D.C. According to the clock, the population of the earth increases by 172 people every minute!

It took all of history until 1850 for the first billion people to appear on earth. The second billion took only 75 years; the fourth billion only took 51 years.

Why is this growing population a problem for the environment?

More people need more food, water and space to live. What does this do to our environment?

DIRECTIONS: On the spaces below, write what you think the effect of more people will be on the following.

Trees, minerals and other natural resources: ______________________________

____

Energy: ______________________________

____

Wildlife: ______________________________

____

Land use: ______________________________

____

Pollution: ______________________________

____

728

Name ______________________________

More People = More Pollution

Water pollution is one result of increased pollution. Dirty water from toilets is often dumped into lakes and rivers. Fertilizers which increase food production are often washed into lakes and rivers. Chemicals from factories and home waste materials, such as phosphate detergents, add more pollution to the water.

In these same waters live tiny plants called algae. Both the fertilizers and the waste materials make the algae grow faster. The algae makes the water look green and slimy. It also uses up the oxygen in the water. Fish cannot live in water that is filled with algae.

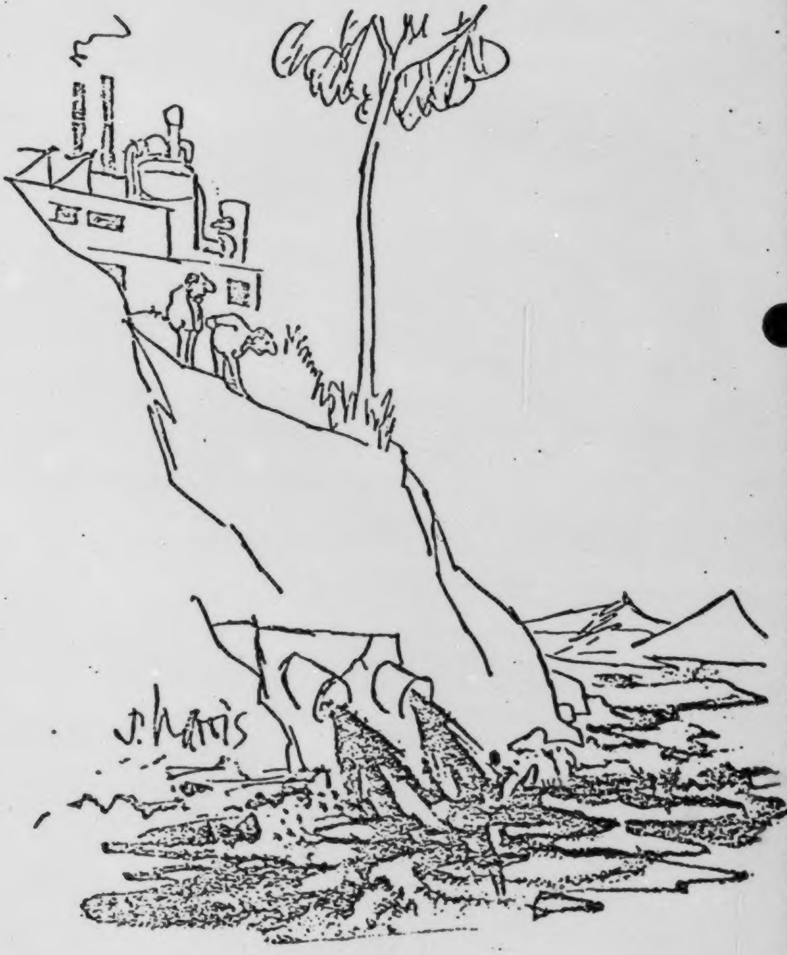
Cartoons are often used to communicate ideas.

This is a cartoon by Sidney Harris from the American Scientist Magazine.

What is the message of this cartoon?

Can you think of any other caption that would go with this cartoon?

Write out your ideas in the space below.



"What's the difference? It was a man-made lake in the first place."

729

Name ______________________________

Transportation

Much of the energy used in the United States is used for transportation. The resource for this energy is oil, from which we make gasoline.

There are more than 100 million automobiles in the United States. An average car travels over 10,000 miles each year and uses more than 650 gallons of gasoline. Altogether, private cars use some 70 billion gallons of gasoline each year. That's about 4.5 billion barrels of oil a day or about two thirds of the amount of petroleum currently being imported into the United States.

Everyone can practice conservation in regards to transportation. If we use less gasoline, we will not need to import as much from other countries.

DIRECTIONS: Read the following statements about ways to conserve gasoline. If you think the statement is correct, write 'true'. If you think the statement is wrong, write 'false'.

______________ 1. Using public transportation, a motorcycle, a moped, a bicycle, or walking will save gasoline.

______________ 2. Sharing a ride or joining a carpool will save gasoline.

______________ 3. If every car in America took just one less 10 mile trip a week, the Nation would save 3½ billion gallons of gas a year.

______________ 4. Driving at 55 miles per hour uses less gasoline than driving at 70 miles per hour.

______________ 5. A careful driver can get 20 percent more miles per gallon than the average driver and 50 percent more than a wasteful one.

To THE CITY
2 MI.

Read the message by writing the letter that comes just before the letter shown.

J G K V T U 1 H B M M P O P G H B T P M J O F X B T

T B W F E F B D I X F F L C Z F W F S Z D B S J O

B N F S J D B, X F D P V M E T B W F B C P V U 5.6

C J M M J P O H B M M P O T P G P J M J O 1 Z F B S.

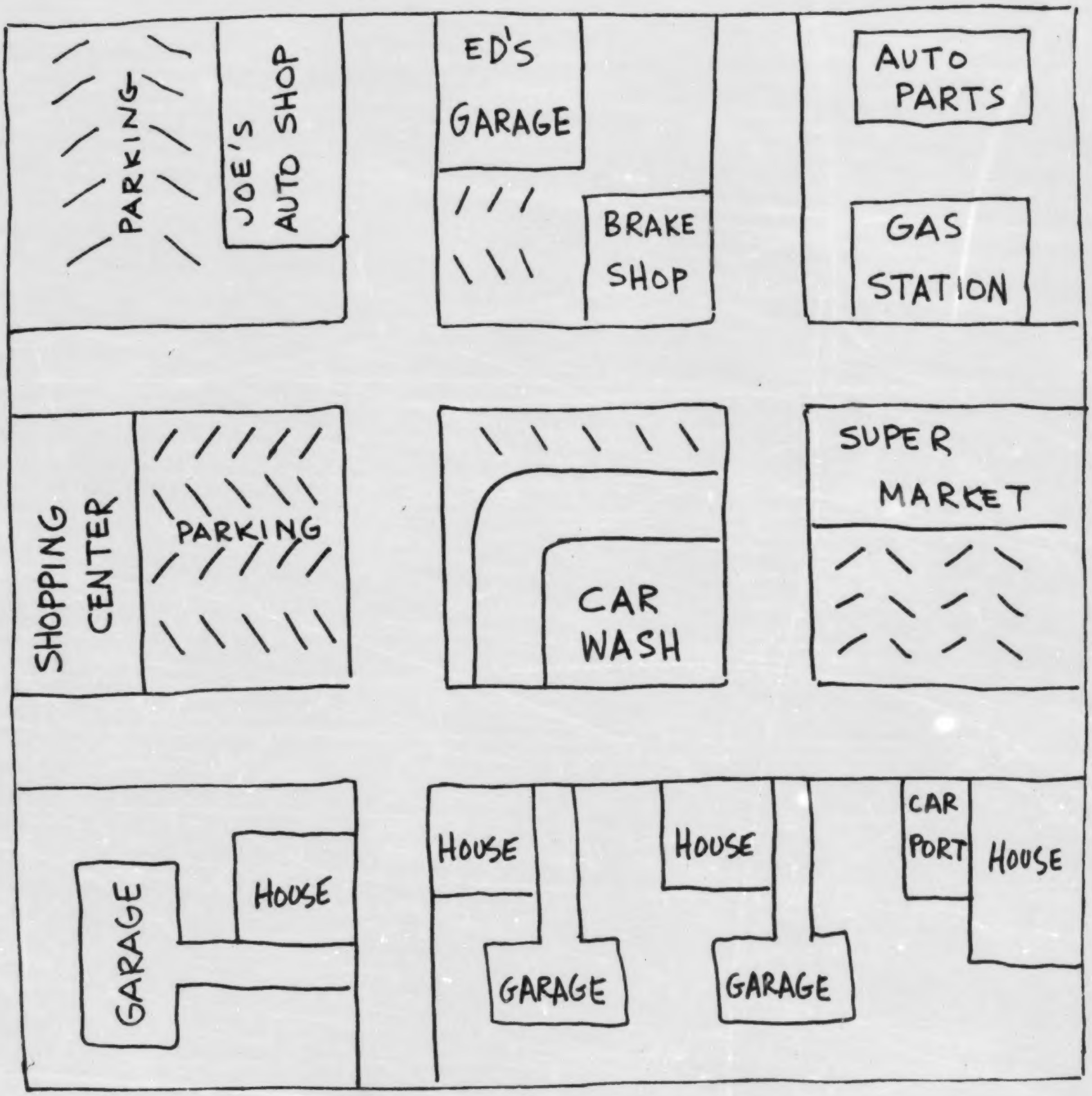
730

Name ______________________________

Land Use and the Automobile

The automobile is an important part of our lives. We can go to more places and see more things because of the automobile. But, when most people use cars for moving around, many more roads must be built. More land is paved with asphalt and concrete for parking spaces. Gas stations and automobile repair shops take up more space. Most houses have garages for one, two, or three cars. In some cities, over half of the land is used for the automobile.

DIRECTIONS: Look at the map below. Color black all the areas that are used for automobiles.


PARKING
JOE'S AUTO SHOP
ED'S GARAGE
BRAKE SHOP
AUTO PARTS
GAS STATION
SHOPPING CENTER
PARKING
CAR WASH
SUPER MARKET
GARAGE
HOUSE
HOUSE
GARAGE
HOUSE
GARAGE
CAR PORT
HOUSE

Name ______________________________

Cars for the Future

Twenty five per cent of all the energy used in the United States is used for transportation. Cars, trucks, airplanes, and other motor vehicles use a lot of fossil fuels. When they burn these fuels, they also add to the air pollution problem.

Many people are working to solve these problems. Some companies are making smaller cars which use less fuel. Other people are trying to invent cars that use other sources of energy to make them go. Cars that will run on electricity, steam, and even solar energy, have been tried. Scientists are also trying to discover other fuels, such as alcohol and gasohol, which do not depend on fossil fuels.

While the search for less polluting fuels and more efficient cars goes on, we can help. We can keep our air clean and conserve the fossil fuels we still have by using mass transit, walking or riding bicycles, and by not taking unnecessary trips.

DIRECTIONS: In the space below, draw a picture of your personally designed car of the future. Answer the questions.

What is your car's energy source? ______________________________

Does it add pollution to the environment? Why or why not? ____________________

____

Name ______________________________

RECYCLING: One Pollution Solution

Recycling means to use waste materials over and over again so as not to use up all our natural resources.

DIRECTIONS: The paragraphs below tell about the process of recycling a car. They are not in the correct order. Put a number, one through six, in front of each paragraph to show the order in which they happen.

_____ The steel is used in making a new car. The car dealer sells the new car.

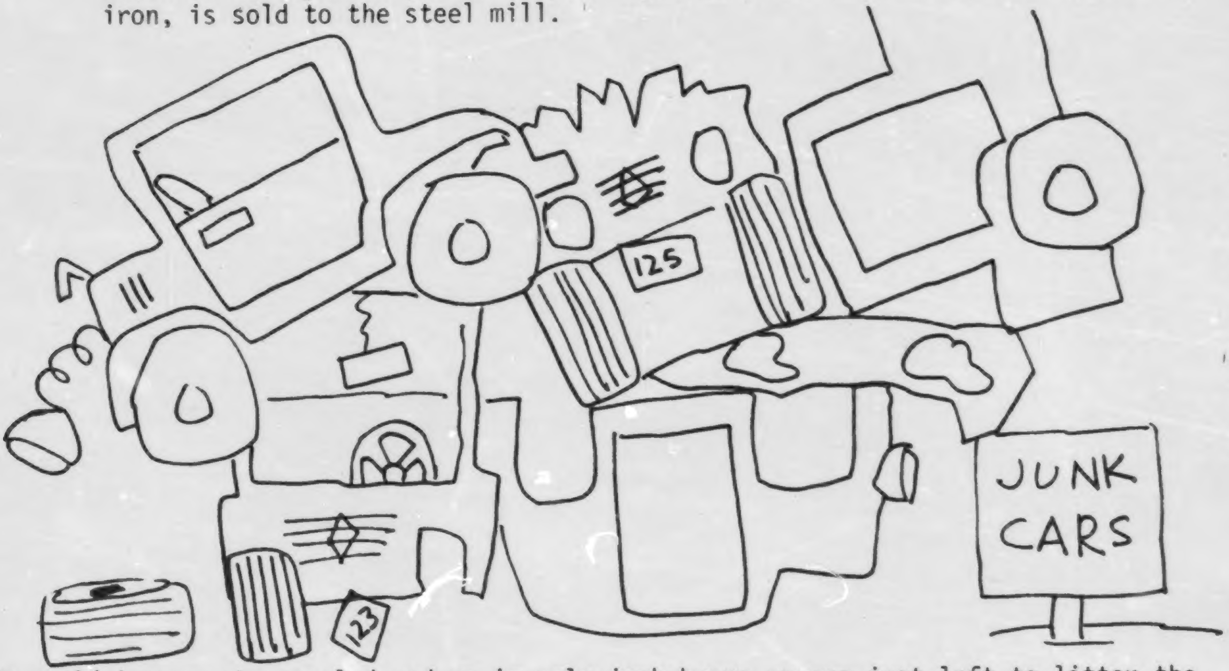
__1__ Metal ore is mined from the earth. To make an average car it takes: 7500 pounds of iron ore, 2500 pounds of coal and hundreds of pounds of copper, lead, zinc and aluminum ores.

_____ The public buys the new car and uses it for about seven years.

_____ The ore is shipped to a steel mill where it is processed to make steel.

_____ Scrap steel is remelted and used in the process of making new steel.

_____ When a car wears out it should be sold to an auto wrecker, who removes parts from the car which can be resold or rebuilt. The shell of the car, which is mostly steel, is cut up or squashed. The metal which contains iron, is sold to the steel mill.



Cars which are not recycled end up in ugly junk heaps or are just left to litter the landscape. Both ways are ugly and waste land. Nowadays, thankfully, most junked vehicles are recycled.

Name ______________________________

Protecting Our Environment

Our government has done many things to protect our environment. They have designated wilderness areas as National Parks and Preserves so that all people may enjoy them. They have also passed laws to protect our wildlife and the environment. The Environmental Protection Agency (EPA) was established by Congress in 1970 to enforce the laws made by the government.

DIRECTIONS: Read the sentences below.
Put a 1 if you think this is a law.
Put a 2 if you think it should be a law.
Put a 3 if you think it should not be a law.

THERE OUGHT TO BE A LAW!
YEAH YEAH

_____ It is unlawful to throw litter from a car.

_____ In California, if you are over 15, you must have a license to fish or hunt.

_____ People may not smoke cigarettes in their homes.

_____ Cars purchased in California must be equipped with smog control devices.

_____ Factories may not dump any waste materials into rivers.

_____ Animal skins or furs may not be used to made clothing.

_____ People may drive cars only if they carry at least three passengers.

_____ Some local agencies can prevent signs and billboards from being put up on roadsides.

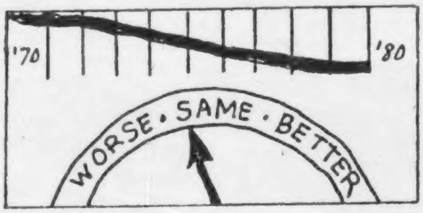
_____ People may not pick or harm plants that have been designated as endangered.

_____ Airplanes which give off fumes or gases that add to air pollution are not allowed to fly.

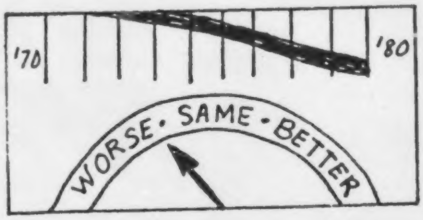
Name ____________________________

National Wildlife is a magazine which you can probably find in your school library. It has many stories and information about plants, animals, and our environment. Every year, the magazine includes an up to date survey about our environmental problems. It is called a 'quality index'.

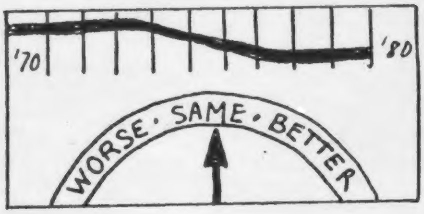
DIRECTIONS: Use the charts, which are printed in the February-March, 1980 issue of National Wildlife magazine, to answer the questions.



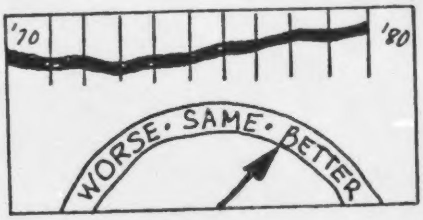
Wildlife



Minerals



Water



Air

1. Is the quality of our wildlife worse, the same, or better?

   ____

2. Which natural resource appears to be the same in quality for the last several years?

   ____

3. Which natural resource appears to be getting worse at the fastest rate?

   ____

4. Which natural resource is getting better in quality? Can you think of any reasons this might be so?

   ____

   ____

Name ______________________________

People Working Together

There are many groups of people who are working together to protect our environment. Some are private groups which you can join. Others are public organizations which are supported by people through taxes.

DIRECTIONS: Read the descriptions of each group. Find the name of the organization by filling in the spaces with the letter that comes before the letter shown beneath.

1. This group was founded by John Muir in 1892. Muir believed that people should visit mountains, rivers, canyons, coasts, deserts, and swamps so that they could learn about, value, and protect them. John Muir helped to establish the first National Park.

   The name of the group founded by John Muir is:

   U I F   T J F S S B   D M V C

2. If you want to learn more about ecology and conservation, you can get many free materials from this organization. Their purpose is to create and encourage an awareness of the need for wise use and proper management of those resources of the earth upon which the lives and welfare of men depend: the soil, the water, the forests, the minerals, the plant life, and the wildlife.

   The name of this organization is the

   O B U J P O B M   X J M E M J G F

   G F E F S B U J P O

3. This international organization was started ten years ago. Its original purpose was to protest nuclear weapon testing in the atmosphere. Later they became involved with efforts to stop the killing of whales and baby harp seals. They are concerned with protecting all parts of our environment.

   The name of this organization is:

   H S F F O Q F B D F

Name ______________________________

DIRECTIONS: Read the questions carefully.
Think!
Write your answers on the spaces.

1. How often is the Annual Environmental Report published?

____

2. What is the Environmental Protection Agency (EPA) supposed to do?

____

3. Who do public parks, like Yosemite National Park, belong to?

____

4. Which is better, atomic energy or nuclear energy?

____

5. Can recycled materials be used again?

____

6. How much oil, coal, and natural gas will be left when we run out of fossil fuels?

____

7. Why can't we wait for more dinosaurs to die to make more fossil fuels?

____

8. If the world population increases by 170 people every 60 seconds, how many more people are there in the world every minute?

____

RELATED ACTIVITIES

The following pages are ideas for integrating conservation activities with areas of the curriculum other than language arts, math, social studies and science. These activities are samples of those included in the 'All Levels' Guide which is the seventh book of the Conservation For Children series.

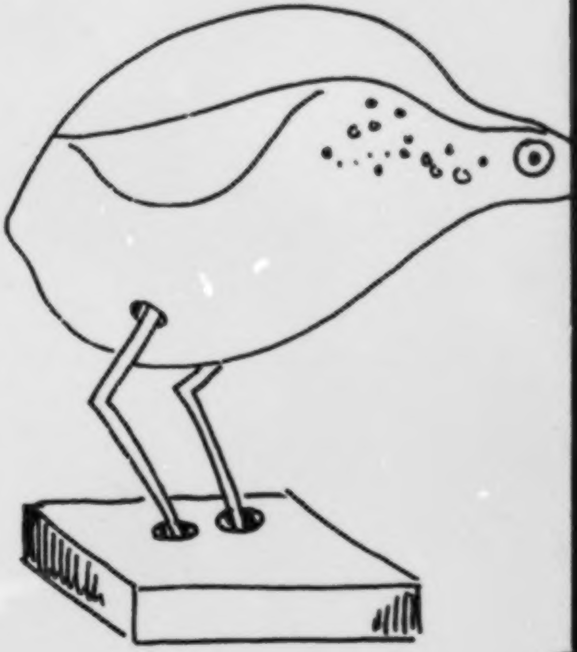
The 'All Levels' Guide contains activities and ideas for art, music, growing plants, and classroom projects, as well as student and teacher bibliographies. The activities and ideas are applicable to many grade levels.

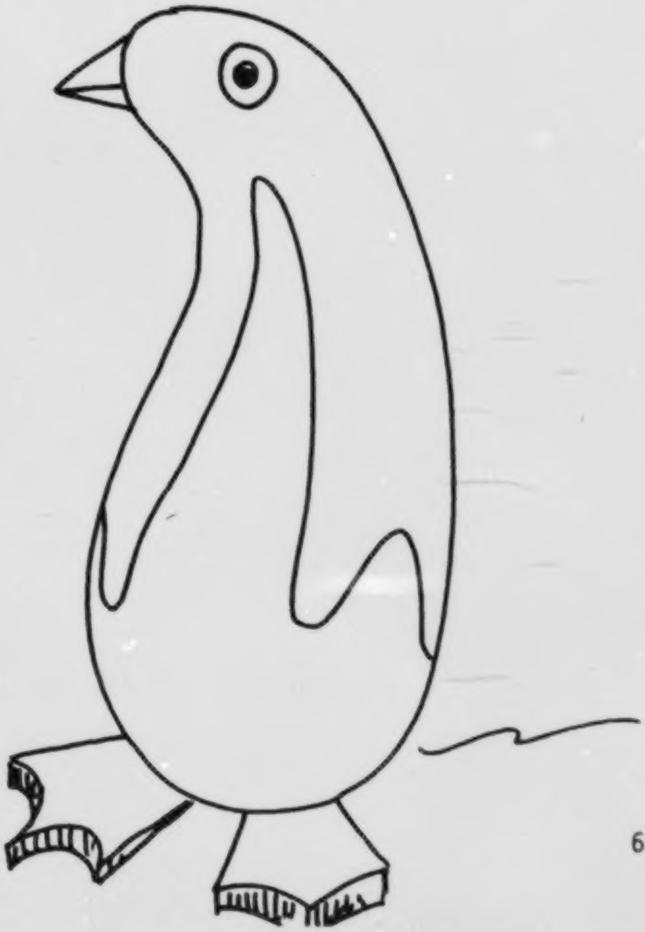
GOURD BIRDS

Beautiful birds can be made from gourds. Choose natural colored gourds for colored birds or paint with acrylic paints. Add eyes and legs and admire!

Materials needed:

Gourds, colored felt pens or paints, clear varnish, household cement.
For penquin-type standing: scissors, stiff cardboard.
For sandpiper-type: small scrap of wood, drill, coat hanger, wire cutters.





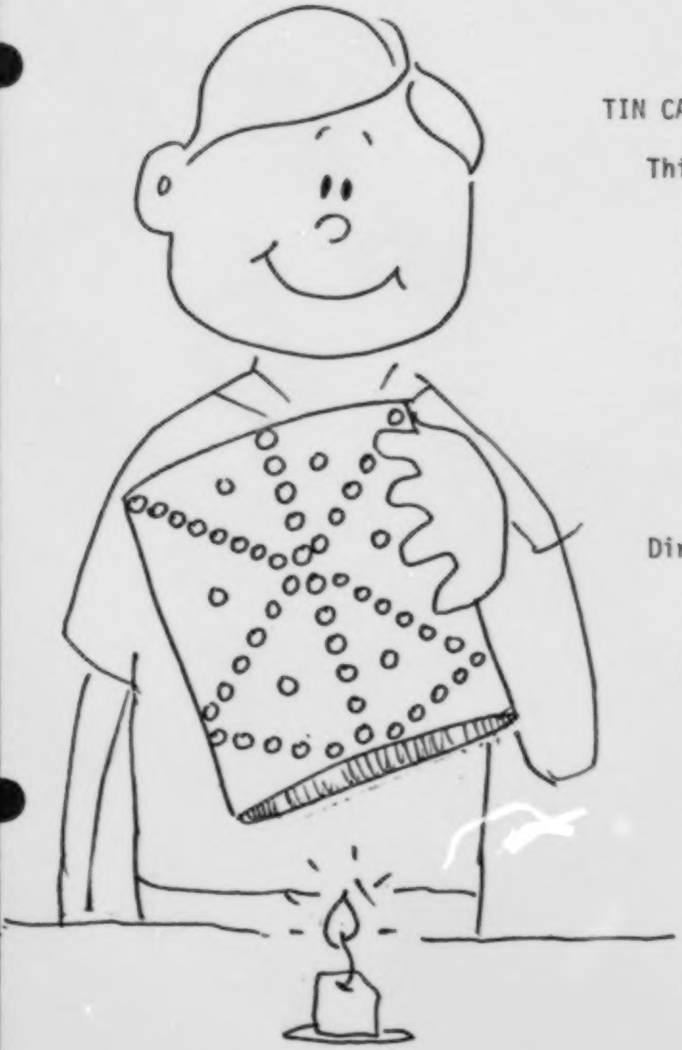
DIRECTIONS

Choose a gourd shaped like a bird. Paint with acrylic paint or simply draw wing lines and eyes.

To balance the penquin, cut out cardboard feet and glue on.

To stand up birds, like the sandpiper, drill two small holes in the gourd and two more in a small wooden base. Cut two equal length pieces of coat hanger wire and glue into the holes in the gourd and the wood.

Paint your gourd birds with clear varnish and let dry.



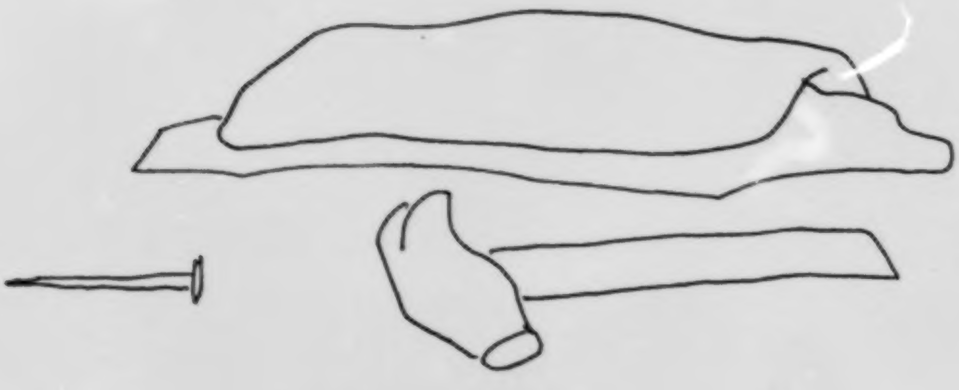
TIN CAN LANTERNS

Things you will need:

Large can with one end removed
Nail
Hammer
Water
Small candle (votive candle in a glass jar works well)
Towel
Crayon or felt pen to mark pattern

Directions:

1. Draw design all around can.
2. Fill the can to 1/4 inch from the top with water. Place the can in a freezer for two days so the ice can get hard.
3. Place the can filled with ice on a towel (to soak up drips as ice melts). Hammer evenly spaced holes through the lines of the pattern.
4. Allow ice to melt. Place can over candle to make pattern glow.



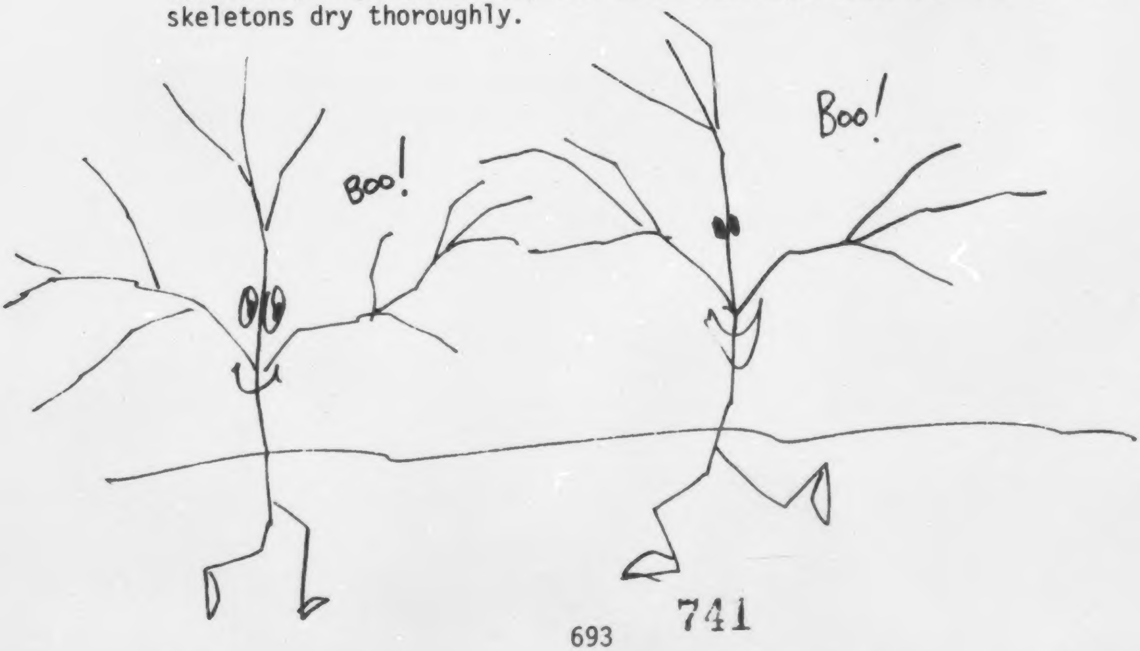
LEAF SKELETONS

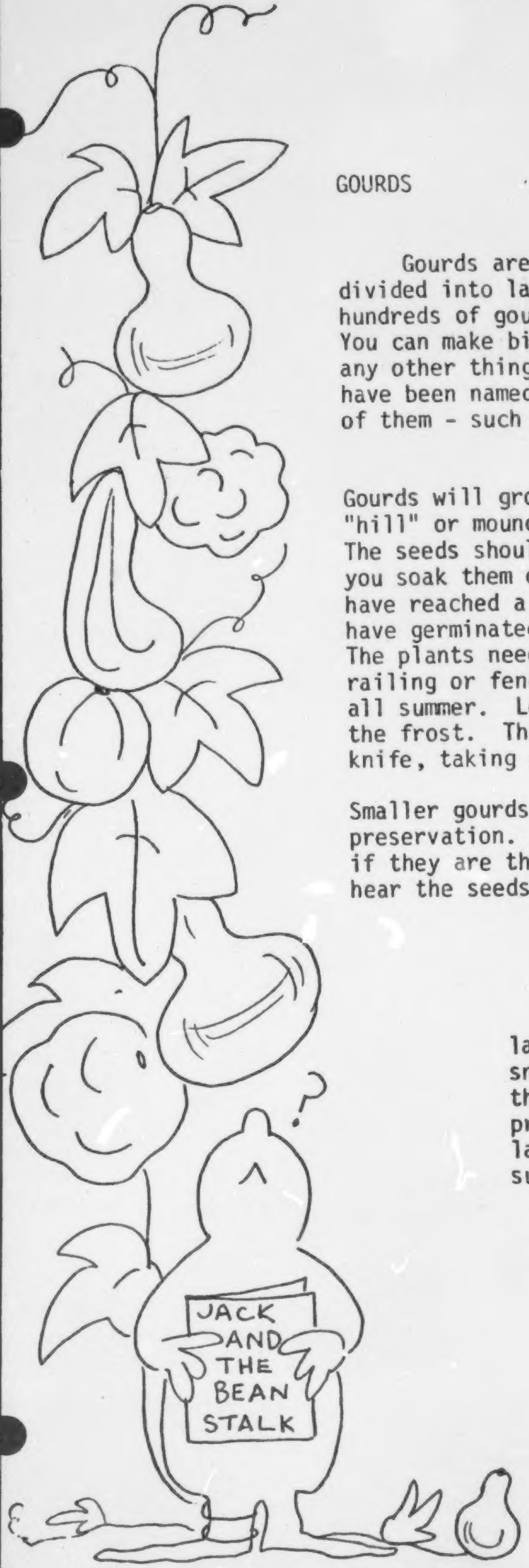
Materials:

Large leaves (those that have heavy veins and texture work best)
Water
Sal soda (a cleaning agent available at the grocery store)
Soft toothbrush
Bleach
Food coloring
Large pot

Directions:

1. Put two quarts of water and two tablespoons of sal soda into large pot. Bring to a boil. Add leaves and cook for a half hour.
2. Let the water cool. Drain the leaves. Rinse with cold water and drain again.
3. Place the leaf on a work surface and with a soft toothbrush, gently brush away the leaf parts, leaving only the stalks and veins.
4. Bleach the leaf skeleton by placing it in a solution of two tablespoons of bleach to one quart of water. Leave leaves in solution for about an hour.
5. The leaves can now be tinted any color desired by placing them in water which has had food coloring added. When the leaves are the desired color, remove them and blot with paper towels. Let the leaf skeletons dry thoroughly.





GOURDS

Gourds are easily grown from seed. Seeds are usually divided into large and small types, both which will provide hundreds of gourds varying in shape, texture, and color. You can make birdhouses, dippers, candleholders, bowls and any other thing you can think of. Some varieties of gourds have been named according to the use most frequently made of them - such as birdhouse gourds, spoon gourds, etc.

Gourds will grow best outdoors. Plant 3 to 5 seeds to a "hill" or mound of soil after danger of frost has past. The seeds should germinate withing a week - sooner if you soak them over night before planting. After the seedlings have reached a height of 2-3 inches, and when all the seeds have germinated, snip off at ground level all but the hardiest. The plants need running room and support such as a trellis, railing or fence. Water regularly and the vine will grow all summer. Let the gourds remain on the vine until after the frost. Then pick or cut from the dry vines with a sharp knife, taking a short part of the stem along with the gourd.

Smaller gourds will require no special treatment for preservation. They need only to be air dried. You can tell if they are thoroughly dry by shaking them. When you can hear the seeds rattling around inside, then they are ready.

Indoors - Plant seeds in 6 inch pots in late February or early March. After germination snip off all but the hardiest as above. Place the seedling in a sunny window and be sure to provide support for the vine. Transplant to a larger container, if necessary, and keep in the sun or as much brightness as possible.

Pineapple Twist

Here is a new way to start a pineapple plant. Instead of cutting off the top with an inch of the fruit (which is the usual way), simply twist off the top part that is the stem and the leaves. Remove the lower leaves to expose the stem about 1½ to 2 inches. Place the top in a small glass and fill with water to the lowest remaining leaves. Keep the water at this level by adding more when needed.

The first roots should form within a week. When the glass is about half filled with strong roots, transplant the pineapple into a pot filled with soil. A regular clay flower pot works fine and can be filled with half soil and half vermiculite or peat moss. Be sure to allow for drainage in the bottom of the pot.

You can make the plant bloom by placing the whole thing (pot and all) in a large plastic bag. Add a ripe apple to the bag and twist the top closed. Don't open the bag for at least five days. The apple releases a gas as it ferments which gets the pineapple started in blooming. After five days, take the pineapple plant out of the bag and care for it as you would any other plant. Within two or three months, the pineapple will flower. With luck, you may even get a baby pineapple from the blossom.

SUPER DIRT PLANT MIX
PEAT MOSS

This Land Was Made for You and Me??

Modern words by Jerry Smith.

Chorus:

This land was your land, this land was my land,
From Los Angeles to Coney Island,
From the logged off forests, to the dirty waters,
This land was made for you and me.

1. As I was walking that ribbon of highway,
The sound of chain saws echoed over the skyway,
And the Redwoods falling,
And the loggers calling,
"This land was made for you and me."

2. I've roamed and rambled,
And I've followed the beer cans,
From the toxic cities to the flooded canyons,
And all around me,
Were the billboards reading,
"This land was made for you and me."

3. The sun came shining, but the hazes hid it,
And cloaked the factories and cars that did it.
As the smog was drifting,
Someone was coughing,
"This land was made for you and me."

Reprinted by permission from the Sierra Club Songbook.

744

Many people are working together to keep our environment clean and healthy for all living things. They will send you information that tells how you can help.

Remember, it takes energy and natural resources to make these materials, so only send for the things you really want to know more about.

Things to Send For ....

Mr. Peanut's Guide to Ecology

This is a 22 page booklet that tells about our 'spaceship earth'. It has lots of ideas on how we can conserve our natural resources.

Write to: Standard Brands Educational Service
Box 2695
Grand Central Station
New York, N.Y. 10017

It's free.

Once There Lived a Wicked Dragon

This is the story of our growing pollution problem and what you can do about it.

Write to: Solid Waste Information Materials Control Section
U.S. Governmental Protection Agency
Cincinnati, Ohio 45268

Ask for booklet No. SW 105.1. It's free.

Energy Activities with Energy Ant

Here's a way to find out about the history of energy from dinosaur days to modern solar heated houses. The activities included dot to dots, crossword puzzles, and other fun things to do.

Write to: Federal Energy Administration
Office of Communications and Public Affairs
Washington, D.C. 20461

It's free.

Environmental Bingo Game

This is a new way to play Bingo and learn about environmental problems and solutions, too.

Write to: Conservation Committee
Garden Club of America
598 Madison Ave.
New York, N.Y. 10022

Send 10¢ for postage and handling charges.

Here are some other things to send for. These materials will give you information about energy and our natural resources.

The Story of Oil

This is a large poster that shows the development of oil.

Write to: Corporate Communications
Union Oil Company
Box 7600
Los Angeles, California 90051

It's free.

Solar Science Projects

This booklet includes directions for making seven solar projects, including a cooker, water heater and radio. It was written by D.S. Halacy, Jr.

Write to: Scholastic Book Services
50 W. 44th St.
New York, N.Y. 10036

Send 75¢.

Earthbeats Newspaper No. 1 on Energy

This newspaper has many articles on alternative fuel sources and how they are being used in different parts of the world.

Write to: Sea Grant College Program
University of Wisconsin
1800 University Ave.
Madison, Wisconsin 53706

It's free.

You and Your Electric Company

Here is a 36 page booklet that has hundreds of facts about electricity and many ideas on how you can save electricity at home.

Write to: Edison Electric Institute
90 Park Ave.
New York, N.Y. 10016

It's free.

STUDENT BIBLIOGRAPHY

Here are some good books to read about conservation and pollution problems. Some may be in your school library. The others can be found in public libraries and book stores.

1. The Giving Tree, Shel Silverstein, Harper and Row Co., N.Y.
   This is a wonderful story about the relationship between a man and a tree.
2. A Changing World for Wildlife, George S. Fichter, Western Pub. Co.
   Problems faced by endangered animals and what we can do about it.
3. Seal Song, Brian Davies, Eliot Porter, Penguin Books.
   The story of the harp seal with beautiful photographs.
4. S.O.S. Save Our Earth, Giancarlo Masini, Grossett & Dunlap, N.Y.
   An ecological message for everyone.
5. It's Your Environment, Environmental Action Coalition, Charles Scribner's Sons.
   Things to think about and lots of experiments to do.
6. The Last Free Bird, A. Harris Stone, Prentice-Hall, Inc.
   A plea to protect the natural beauty and wonders of our land.
7. The World You Inherit, John G. Navarra, Natural History Press
   The story of our polluted planet.
8. The Varmints: Our Unwanted Wildlife, M. Frome, Coward McCann Pub.
   The use and importance of twelve unwanted animals including coyotes.
9. The Only Earth We Have, Lawrence Pringle, Macmillan Pub. Co.
   Pollution problems and what we can do to make it better.

Add the titles of other books about conservation.

10.

11.

12.

13.

14.

15.

747

16.

17.

18.

Name

RECYCLE [illegible]?

We all know that the earth's supply of resources is limited. The faster we use the minerals and fossil fuels from the earth, the sooner they will be gone. We need these minerals and fuels to provide energy and products for our everyday living. The best way to protect our supply of natural resources is to conserve what we have.

Recycling is important because it saves our material resources and prevents waste and trash build-up. Although it requires far less energy than manufacturing items from mined ores, it does take energy to recycle old products into new ones. Fuels are needed to transport materials to recycling centers and to provide power to run the machinery that will crush, melt, and mold the old items into new ones.

Better than recycling is simply to avoid waste in the first place by reusing things. This conservation method saves our natural materials and the energy needed to make new products. Some examples of this type of conservation include:

. buying products that will last a long time or can be easily repaired, or
. buying products in reusable containers, such as returnable milk or soda bottles, or
. giving out-grown clothing to other people who can use it, and
. repairing or painting old furniture.

Many items can also be reused for different purposes. Old jars may make pretty flower vases, unusable clothing can become dust rags, and many craft projects can be made with discarded materials.

To help conserve our natural resources and energy, reuse all you can and recycle the rest.

Draw a line under the correct words for each sentence.

1. Recycling uses less / more energy than manufacturing items from mined ores.

2. Recycling is important because it doesn't use any energy. / gets rid of waste and saves materials.

3. Recycling / Reusing materials requires no fuel for energy.

4. The best way to conserve our natural resources of materials and energy is to recycle items. / reuse items.

Name

DIRECTIONS: Use the words in the box to complete the story. Read the story again to be sure it makes sense.

amount	safety	environment	expenses	pollutants
accidents	storage	uranium	sabotage	temperature

Nuclear Energy

There is more disagreement over the use of nuclear power than any other source of energy.

People who believe that nuclear energy is a good alternative source of power list the following reasons.

NUCLEAR POWER NOW!!!

. Nuclear reactor power plants do not produce the air pollutants associated with coal and other fossil fuel plants.

. Nuclear energy plants use only a small amount of fuel. Breeder reactors 'breed' or create more energy than they use.

. The fuels necessary, like uranium are plentiful enough to last for hundreds of years.

. Nuclear energy is better for the environment because the fuels necessary require less digging and mining.

. Nuclear power plants have higher safety regulations than any other type of plant.

People who are against nuclear energy list these reasons.

. There is the danger of accidents which could allow radioactive materials to escape into the environment and endanger life.

. Radioactive wastes must be stored for hundreds of years before they are safe. Safe storage and the effects on future generations are questionable.

. Hot water is a waste material which can raise the Temperature of streams and oceans and could destroy wildlife.

. The danger of theft and sabotage is frightening. These are the same materials used to make atomic bombs.

. Expenses of building nuclea plants do not make it an economical power sourc

---

ZOOM
35¢
CAPTAIN REX

Name

Everyone would like to see clean air and water and land that is free from waste and litter. But, to get this pollution-free environment usually requires some compromise.

We often blame industry for many of our pollution problems. Dirty fumes from factory smokestacks, waste materials in run-off water, and chemical dumping are all things we would like to stop. We have even made laws to control some of this pollution.

But, when factories are forced to install equipment that will filter or clean their wastes, it costs them money. This higher cost is often added to the price of their product. This means that you, the buyer, will now have to pay more money for the same product.

For example:

The Captain Rex Comic Book Company had been printing comic books and selling them for 25¢ each. Part of their manufacturing process included pulp making which sent gallons of dirty water into the river next to the factory. People in the town complained that this water was polluting the river. They wanted the Captain Rex Company to install filters to clean the water and end the pollution. The environmental laws also demanded that the pollution be stopped so the company installed the new filtering equipment. However, the filters were very expensive so they raised the price of their comic books to 35¢ to help pay for the equipment. Now the people are angry because the comic books cost more.

Write the answers to these questions.

1. What was causing the river pollution?
Dirty water from the factory

2. Who wanted the pollution stopped?
The people in town

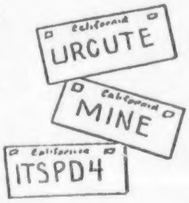
3. Why did the Captain Rex Comic Book Company raise the price of their books?
To help pay the cost of the new filtering equipment that had to be installed

4. Do you think the company did what the people wanted? Why or why not? (use the back of this paper to explain your answer.)

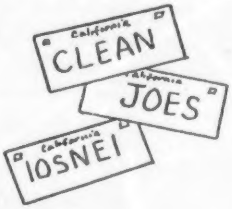
Name

Environmental License Plates

Have you seen personalized license plates on cars? These are the license plates that have names, messages or funny sayings. They are called environmental license plates.



The extra money that people pay for these license plates is used to help our environment. Some of the money is used for research projects such as ways to get rid of air pollution or prevention of soil erosion. Other funds are used to buy land for animal reserves or natural areas. School programs to teach conservation are also made possible with money from these license plates.



People who want these license plates must fill out an application at their local Department of Motor Vehicles. They are asked to check a list of over 480,972 licenses (as of January 4, 1979) to be sure that someone else does not already have the one that they want.

The cost is $25.00 when you apply and then $10.00 a year over your regular license fee. There is also a charge of $12.00 to transfer the license plates from one car to another.

Names or messages are limited to seven characters (numbers or letters).

Answer the questions.

1. Write three things that the money from these license plates is used for.
Environmental research projects
Buy land for animal reserves or natural areas
School conservation programs

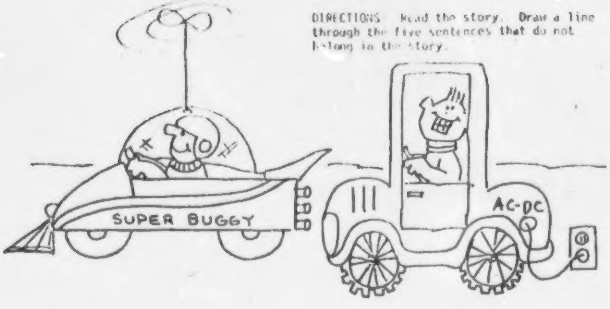
2. How much do they cost when you apply? $25.00

3. How much more per year than your regular license fees do you pay? $10.00

4. How many environmental license plates are there (as of 1/4/79)? 480,972

5. If you could order one, what would it say?

Answers 610, 611, 613, 614



Name

DIRECTIONS: Read the story. Draw a line through the five sentences that do not belong in the story.

Transportation for Tomorrow

Much of our energy and natural resources are used for transportation. Oil and minerals are used both to manufacture cars and to make them go. ~~Fire engines are painted red.~~ With both energy and resources running low, alternative methods of transportation are being sought.

Try to imagine a different method of transportation for the future. Here are some changes you might find.

Cars on the street are an uncommon sight. People are now using their own muscle power and are walking whenever they can. There are bike-type vehicles of all sizes and shapes, from unicycles to mopeds to all weather plastic enclosed three-wheelers and five-seaters. ~~The bicycle was invented in Germany~~. There are golf-cart size electric cars for transporting greater numbers of people than bikes can handle. You may see electric vans and busses for public transportation. These might run down the centers of streets, separated from the bicycle lanes. Here and there you may see larger cars, to be used for long distance trips, which have been rented from city car pools. ~~Water pollution is a major problem in our country.~~

Electric vehicles may run on miniature batteries which can be recharged by plugging them into solar power sources. ~~A volcano is an example of geothermal power.~~ Other vehicles may run on alcohol-based fuels made from agricultural wastes or special crops grown for this purpose. ~~Scientists are developing new pesticides~~.

All of these ideas are possible now but change is not easy and there are problems to overcome. Finding solutions is a challenging opportunity for people interested in improving our environment and saving our resources.

615

Name

DIRECTIONS: The energy headings are missing in the outline below. Use the possible sources of energy listed in the box to fill in the blank spaces.

Hydroelectric	Wind	Shale	Tidal	Solar
Nuclear	Garbage	Geothermal		

1. Solar
   - A. Represents energy from the sun.
   - B. May be used directly or changed into steam or electricity.
2. Geothermal
   - A. Produced by steam formed from water warmed by underground heat.
   - B. Can turn turbines to generate electricity.
3. Shale
   - A. Rock sometimes containing oil.
   - B. Must be broken and placed under heat and pressure to release oil.
4. Garbage
   - A. Solid waste thrown away can be burned to produce heat.
   - B. Gas from decomposing waste can be collected and used for fuel.
5. Wind
   - A. Has been used for centuries to turn windmills and pump water.
   - B. Can generate electricity.
6. Hydroelectric
   - A. Produced by falling or rushing water.
   - B. Dams are often built to provide this type of energy.
7. Nuclear
   - A. Atoms contain great amounts of energy.
   - B. Must be changed in large plants to produce heat for electricity.
8. Tidal
   - A. Levels of ocean waters are constantly changing.
   - B. If harnessed, they can produce great amounts of energy.

616

Name

Nuclear power is an important source of energy. Uranium atoms are split by a process called fission. The high heat which results is used to produce steam, which in turn generates electricity.

There are several reasons why nuclear power is not being developed as fast as possible.

First, many people think that the nuclear reactors, where the atoms are split, are not safe. They are afraid that radiation may leak or explosions will occur that could contaminate people and wildlife.

People are also concerned about the disposal problems of nuclear waste. The process of developing nuclear energy creates radioactive waste materials which must be stored for hundreds of years.

A third reason is that it takes a long time to get a nuclear plant working. Sometimes it can take as long as twelve years before a new plant can begin operating.

Lastly, costs for building the nuclear plants have greatly increased. The cost of construction materials, labor and uranium fuel is very high.

In 1978, there were some 69 nuclear power plants in operation. They produced about 12% of our electricity. By 1995, as many as 200 could be in operation if we could solve some of these problems.

Answer the following questions.

1. The main idea of this story is (underline the best choice)

   the danger of uranium atoms.
   problems of nuclear energy.
   power sources of the future.

2. Write four reasons why nuclear power is not being developed faster.

   Fear that reactors are not safe
   Concern about nuclear waste disposal
   It takes a long time to get a nuclear plant working.
   High cost of construction, labor, and fuel

618

Name

WHAT IS RADIATION?

Radiation is defined as energy moving through space as invisible waves. There are two types of radiation: ionizing and non-ionizing. Ionizing radiation creates electrically charged ions which can disrupt body processes, including life. Nuclear weapons produce ionizing radiation, as do X-rays and some television sets.

Non-ionizing radiation is produced by microwaves, light and sound but lacks the ability to create ions. It can, however, disrupt body processes too. It usually causes sickness rather than death, but too much can be fatal.

All of us are exposed to radiation every day. Most of it is low-level radiation that poses a minor, but continual risk.

Radiation is measured in roentgens or milliroentgens. (There are 1000 milliroentgens in a roentgen.) A dental X-ray emits about 200 milliroentgens. By law, TV sets may not emit more than half a milliroentgen an hour.

But when scientists talk about danger, they talk about rems, or millirems, which refer to the amount of radiation energy absorbed by the body. The average person gets about 100 to 120 millirems a year from background radiation.

Use the information above to complete the sentences.

1. There are 1000 milliroentgens in a roentgen.
2. The amount of radiation absorbed by the human body is measured in rems.
3. Nuclear weapons produce ionizing radiation.
4. Radiation produced by light and sound lacks the ability to create ions.
5. The average person gets about 100 - 120 millirems a year.

619

Answers 615, 616, 618, 619

Name ____________

DIRECTIONS: Read the story. Follow the directions to find the answer to the riddle.

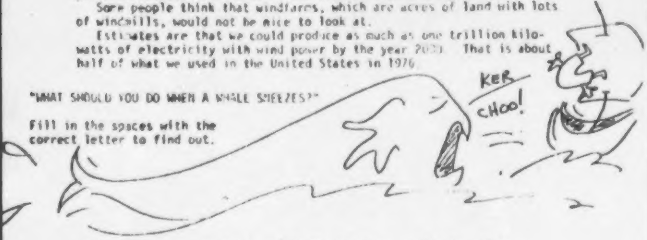
WIND POWER

The wind is one of our oldest and best-understood energy sources. People have used it to move ships across the oceans for thousands of years. In areas where there are steady breezes, modern windmills can generate huge amounts of power.

A big advantage to using wind power is that, like solar power, it is quiet and nonpolluting. It is also free and cannot be used up. Another advantage is that windmills can be located close to where the power is needed, thus reducing the cost of transmitting the power.

Some people think that windfarms, which are acres of land with lots of windmills, would not be nice to look at.

Estimates are that we could produce as much as one trillion kilowatts of electricity with wind power by the year 2000. That is about half of what we used in the United States in 1976.



"WHAT SHOULD YOU DO WHEN A WHALE SNEEZES?"

Fill in the spaces with the correct letter to find out.

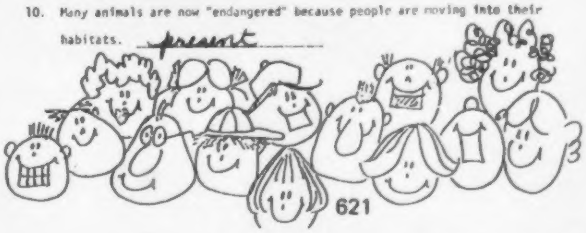
P U T U P Y O U R S A I L!
1 2 3 2 1 4 5 2 6 7 8 9 10

Space No.		
1	True = R, False = P	Wind power is expensive to use.
2	True = U, False = A	Acres of windmills are called windfarms.
3	True = B, False = T	Wind power is a new energy source.
4	True = Y, False = D	Some people think windfarms would be ugly to see.
5	True = I, False = O	Wind power cannot be used for transportation.
6	True = R, False = S	Wind power is nonpolluting.
7	True = S, False = H	Kilowatts are used to measure electricity.
8	True = M, False = A	Wind power is very noisy.
9	True = I, False = W	We know a lot about wind power.
10	True = L, False = T	Wind power is an alternative energy source.

Name ____________

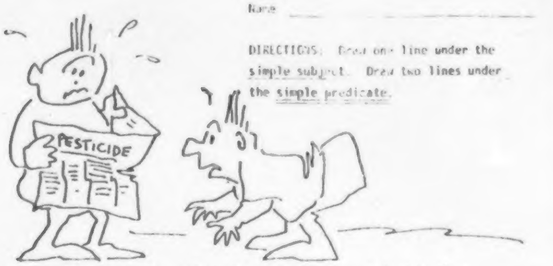
DIRECTIONS: Write past, present, or future in the space after each sentence to show the correct tense.

1. Population affects our environment in many ways. present
2. In 1650, the population of the world was about 500 million people. past
3. By the year 2000, there may be 7 billion people on the earth. future
4. Some people worry that there is not enough food or space for all these people. present
5. Population growth has been blamed by many as the major cause of pollution. past
6. We have an "energy crisis" because there are many more people in the world today. present
7. The United States has 6% of the world's population. present
8. More people will need more natural resources from the earth. future
9. There used to be enough land for both animals and people. past
10. Many animals are now "endangered" because people are moving into their habitats. present



Name ____________

DIRECTIONS: Draw one line under the simple subject. Draw two lines under the simple predicate.



1. Many people in the world today don't have enough food to live.
2. The world's population is continuing to increase.
3. More people will need more food.
4. Only 30% of the world's land is suitable for growing food.
5. Houses, factories, and highways are often built on lands that could be used for growing food.
6. Insects can destroy valuable food crops.
7. Pesticide use can increase crop production up to 100%.
8. Farmers can get twice as much food from the same plant.
9. But, pesticides are also dangerous to the environment.
10. They kill good insects and animals as well as the troublesome ones.
11. Population, pesticides, and food needs are big problems.
12. We need to find some solutions soon.

Name ____________

DIRECTIONS: Write yes in front of each group of words that is a complete sentence. Write no in front of each group of words that is not a complete sentence.

yes 1. Ocean tides can be used to create energy. (5, 8, 13)

no 2. At the Bay of Fundy, in Nova Scotia, where the tides rise and fall over forty feet. (7, 2, 4)

yes 3. When the tide rises, the water is trapped by dams. (3, 14)

no 4. As the water is released. (5, 9)

yes 5. This creates energy just like rivers and waterfalls. (4, 7, 9)

yes 6. Tidal energy is not created by the power of the waves. (11, 1, 10)

no 7. The costs of building the large dams needed. (1, 8)

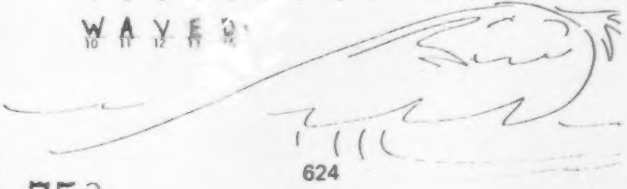
yes 8. Tidal energy does not seem like a realistic alternative at this time. (6, 2, 12)

Use the numbered letters in the complete sentences only to find out:

"What did the ocean say to the shore?"

N O T H I N G. I T J U S T
1 2 3 4 5 1 6 5 3 7 8 9 3

W A V E D.
10 11 12 13 14



Answers 620, 621, 623, 624

Name

DIRECTIONS: List the following words under the environment in which they would most likely be found.

watershed aerosol mulch salinity flume erosion
compost carbon monoxide reservoir smog strip mining
chlorination ozone algae green belt atmosphere
inversion hydro

WATER	EARTH	AIR
1 salinity	1 mulch	1 aerosol
2 flume	2 erosion	2 carbon monoxide
3 reservoir	3 compost	3 smog
4 chlorination	4 strip mining	4 ozone
5 algae	5 green belts	5 atmosphere
6 hydro	6 watershed	6 inversion

Using the same words, fill in the sentences with the correct word.

1. The atmosphere is the body of air that surrounds the earth.
2. Salinity tells how much salt is in water.
3. Simple rootless plants that grow in water are called algae.
4. Aerosol spray cans are believed to be dangerous to the ozone layer of the atmosphere.
5. The land area that drains into a stream is called the watershed

625

Name

DIRECTIONS: Complete the sentences. Use the clue words to answer the riddle.

1. Twenty five percent of the energy we use is for T R A N S P O R T A T I O N.
   2 4 12 15 1 3 5 4 2 12 2 13 5 15
2. Cars are the largest source of air P O L L U T I O N.
   3 5 9 9 16 2 13 5 15
3. Buses and trains are forms of M A S S T R A N S I T.
   11 12 1 1 2 4 12 15 1 13 2
4. Most cities have half of their land paved for the use of the A U T O M O B I L E.
   12 8 2 5 11 5 17 13 9 14
5. Railroads use less energy per mile hauling freight than T R U C K S.
   2 4 8 10 7 1
6. Driving at slower speeds saves G A S O L I N E.
   18 12 1 5 9 13 15 14
7. The fossil fuel used to make gasoline is O I L.
   5 13 9
8. Whenever we can, we should ride a bike or W A L K.
   6 12 9 7

WHAT WOULD WE HAVE IF ALL THE CARS IN AMERICA WERE PINK?

A P I N K C A R N A T I O N!
12 3 13 15 7 10 12 4 15 12 2 13 5 15

BUT I WANT A GREEN ONE
123

626

Name

DIRECTIONS: Complete this outline using the topic headings below.

Encouraging Mass Transit
Improving Commuter Habits
Reducing Automobile Size and Weight
Using Railroads More

TRANSPORTATION

A. Accounts for 25% of our total energy use
B. Ways of saving energy
   1. Reducing Automobile Size and Weight
      a. Each 400 pound weight reduction improves performance by one mile per gallon.
      b. New mileage requirements for American cars (fleet average twenty miles per gallon by 1980) will save 700,000 barrels of oil a day.
   2. Improving Commuter Habits
      a. Increasing the number of passengers riding together can save additional fuel.
      b. Companies should encourage car pooling.
   3. Using Railroads More
      a. Railroads can haul freight over long distances using only one quarter the energy per ton/mile that trucks need.
   4. Encouraging Mass Transit
      a. Buses or trains use less than half as much energy per passenger mile as private autos.

627

Name

Many people are trying to invent cars that don't run on gasoline. Unscramble the words to complete each sentence. Write the words on the spaces.

1. Gasoline is made from LIO. O I L
2. Oil is a fossil LUEF that is being used up rapidly. F U E L
3. People have made TEELCCIR cars. E L E C T R I C
4. Even MEATS engines have worked in cars. S T E A M
5. LOARS energy engines are being tried also. S O L A R
6. Scientists are continuing to look at all BILITOSSPEISI.
   P O S S I B I L I T I E S
   1 2 3

Use the last word to complete the riddle.

Bob - "I have a car that has no engine and no wheels. All it has is a horn."
Joe - "How does it go?"
Bob - "B E E P ! B E E P !"
2 3 3 1 2 3 3 1

628

Answers 625, 626, 627, 628

Name ______________________

DIRECTIONS: Todd is writing a report about the use of solar energy for heating. He has misspelled ten words. Find the words and draw a circle around them. Write the words correctly at the bottom of the page.

SOLAR HEATING

The sun can provide 50 to 80% of our home heating needs. Thousends of solar water and space heating sistems are already operating.

Here are some of the advantages of solar heating.

1. Operatcing costs after the initial installation are low except for maintenance.
2. Solar heating is nonpoluting. There is no noise and no waste.
3. Technology is developing rapidley. Relyable collectors and other materials are widely available.

The biggest disadvantage to solar heating is that it is expensive to enstall in allready existing homes. People can get money back from their taxes for solar devices they have bought. Perhaps this will encourag more people to use solar heating.

Solar heeting is an alternative that's "here and now".

By Todd

Write the words correctly on the spaces below.

1. thousands
2. systems
3. operating
4. nonpolluting
5. rapidly
6. reliable
7. install
8. already
9. encourage
10. heating

Name ______________________

Read the Table of Contents

Table of Contents

Foreword 3

Energy
- The Energy Crisis 6
- Nature's Storehouse 11
- Nuclear Power 16
- Harnessing the Sun 21

Chemicals
- Pests and Poisons 28

Air
- Causes of Smog 32
- Cleaning Up Our Air 44

Water
- The Water Cycle 47
- Disposing of Sewage 49
- Pure, Clean Water, Again 52

Land
- Restoring the Earth 61
- The Problem of Litter 73

Between what pages will you find information on the following subjects?

Subject	Between page ?	and page ?
1. Using solar energy for heating water.	21	28
2. The automobile is the largest cause of air pollution.	32	44
3. Evaporation of rivers and lakes forms clouds to provide rain.	47	49
4. Bottles and cans are polluting our land.	73	-
5. The benefits and dangers of atomic power.	16	21
6. Governments have set clean air standards.	44	47
7. Trees and minerals are some of our natural resources.	11	16
8. Insecticides kill good insects as well as harmful ones.	28	32

Name ______________________

DIRECTIONS: Using the dictionary guide words, write the words from the list below on the pages where they would be found.

conservation tidal population pollution exhaust
environment hydroelectric geothermal radiation
readtor nuclear alternative solar technology

GUIDE WORD		GUIDE WORD
racket	radiation	radio
tea	technology	teeth
hurry	hydroelectric	inch
alphabet	alternative	although
geometry	geothermal	geyser
exercise	exhaust	face
tickle	tidal	timber
reach	reactor	read
poor	population	porcupine
soil	solar	soldier
nothing	nuclear	number
picture	pollution	poor

MIRROR, MIRROR, ON THE WALL.....

Name ______________________

Art Buchwald is the author of thirteen books and a syndicated columnist whose articles appear in over 500 newspapers.

He has written a book called The Bollo Caper: A Fable for Children of all Ages. It is the story of Bollo the leopard who believes that the only one who has a right to wear a leopard fur coat is a leopard.

The book was illustrated by Julie Brinkloe and was published by Doubleday Company in 1973. It has 56 pages.

Use this information to make a library card for this book. Remember that fiction books are located under the author's last name and do not have library call numbers.

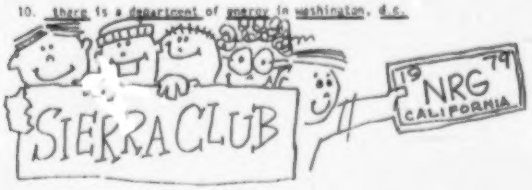
Call Number ___

Conservation - Fiction — Subject
Buchwald, Art — Author
The Bollo Caper: A Fable for Children of all Ages — Title
Julie Brinkloe — Illustrator
Doubleday 1973 — Publisher, Year
56 p. — No. of pages

Name

DIRECTIONS: Underline each word that should begin with a capital letter.

1. an organization concerned with the number of people on the earth is called zero population growth, or ZPG for short.
2. the national audubon society is concerned with the protection of wild birds.
3. you can get environmental materials and posters from the national wildlife federation.
4. "the giving tree" is a book by shel silverstein about the relationship between a man and a tree.
5. captain hydro workbooks are available from the santa clara valley water district.
6. the walt disney company has a mickey mouse comic book about energy conservation.
7. another group concerned with protecting all of our environment is the sierra club.
8. the california environmental protection agency uses the money from personalized car license plates to help our wildlife.
9. national wildlife week is usually held in the month of march.
10. there is a department of energy in washington, d.c.



633

Name

DIRECTIONS: Solve the riddle by answering the questions correctly.

Riddle: WHAT DID THE MAN SAY TO HIS GAS TANK???

O If muscle power is the least polluting form of transportation, put O. If not, put R.

I If most cars use natural gas for fuel, put A. If not, put I.

C If car pools are swimming places for automobiles, put D. If not, put C.

U If most cities have half of their land paved for automobile use, put U. If not, put I.

R If the Empire State Building is the largest thing built by man, put D. If not, put R.

M If roads and highways do not disturb animal habitats, put E. If they do, put M.

T If automobiles are the largest source of air pollution in California, put T. If not, put A.

634

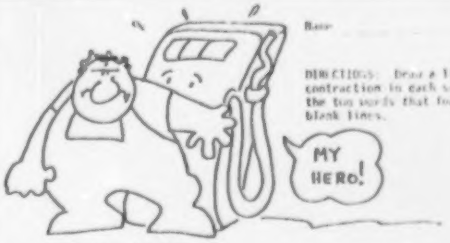
Name

DIRECTIONS: A conjunction connects single words, groups of words, or groups of ideas. Draw a line under each conjunction in the following sentences.

1. When people buy products with extra packaging, they are causing waste and pollution.
2. You can influence companies to stop wasteful packaging if you refuse to buy products with that type of wrapping.
3. Do not buy products in hard-to-dispose-of packages because they add to waste disposal problems.
4. Wrappings of cellophane, styrofoam, or those plastics made of polyvinyl chloride (PVC) give off harmful pollutants when burned and are not biodegradable.
5. Mixed packaging, such as cardboard containers with metal tops, are hard to recycle since the different parts must be separated.
6. Individually wrapped foods, such as cheese slices, bagged candies, and single-serving juice cans, are wasteful and cost you more money.
7. Take a string bag or shopping bag with you when you shop, and carry your purchases home in that.
8. Refuse a store bag if you don't need it.
9. Write to the presidents of companies that overpackage their products and ask them to change their packaging methods.
10. Use either china or glass instead of paper cups and dishes.
11. These may sound like little ideas but they can make a big difference for our environment.

CHEESE SLICES
GOOPO SHAMPOO
JUICE
JUICE
JUICE

635



Name

DIRECTIONS: Draw a line under the contraction in each sentence. Write the two words that form it on the blank lines.

Tips To Save Gasoline

1. Warming up a car engine isn't necessary.	is not
2. It wastes gas and doesn't make the engine run any better.	does not
3. It's true that the faster a car goes, the more gas it uses per mile.	it is
4. We'll save the most gas when we drive between 35 and 40 miles per hour.	we will
5. You shouldn't tie luggage or equipment on the top of your car.	should not
6. They'll cause wind resistance which lowers your gas mileage.	they will
7. The heavier your car is, the more gasoline you'll need.	you will
8. Every 400 pound weight reduction means you're improving performance by one mile per gallon.	you are
9. Plan wisely and don't take unnecessary trips.	do not
10. We can't afford to waste gasoline.	can not

636

Answers 633, 634, 635, 636

Name ____________________

DIRECTIONS: On the line at the right of each sentence write the adjective that modifies the underlined noun. Do not write "a", "an", or "the".

1. Geothermal power is produced by underground steam. underground
2. Underground water is heated by the molten rock in the earth's core. molten
3. This steam can form natural geysers such as Old Faithful in Yellowstone National Park. natural
4. Deep wells can also be drilled into the earth to use this steam for geothermal power plants. deep
5. The hot steam turns turbines which generate electricity. hot
6. Although this appears to be a free and lasting energy source, there are some difficult problems to be solved. difficult
7. Underground water often contains corrosive salts, minerals, and parts of rock which can ruin pipes. corrosive
8. The hot mineral water cannot be allowed to mix with surface water because it can ruin land used for growing crops. surface
9. Another problem is the odorous gases which escape with the steaming water. odorous
10. The rotten-egg smell of hydrogen sulfide is common with strong mineral waters. rotten-egg
11. Uses for waste heat generated by these plants also need to be found. waste
12. The waste heat could raise the temperature of surrounding areas and cause agricultural problems. surrounding
13. There is also the danger of the land sinking as large quantities of water are pumped up from beneath the earth. large
14. Many people are working hard to find solutions to these problems. many

637

Name ____________________

DIRECTIONS: Read the story. Draw a line under the compound words. Write them on the spaces below.

Today, wherever we look there are automobiles. They are the biggest cause of our air pollution. Most cities have half of their land paved for automobile use and we are building more and more freeways every day. In fact, the largest thing built by man is the highway.

Years ago, most people in cities used streetcars and buses instead of cars. Many people also walked or rode bicycles to get places.

Now, people who care about the environment are asking us to use cars less. They say that we should travel on buses, railroads, or airplanes. This is called MASS TRANSPORTATION. When many people ride together in one vehicle, there is less pollution from power.

Another solution to automobile pollution is to use more muscle power. Walk or ride your bike whenever you can. Muscle power doesn't pollute at all. Remember, we all need to breathe, so air pollution is everyone's problem.

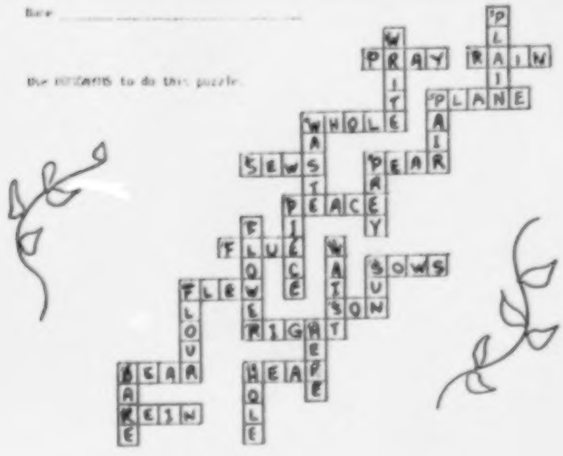
Compound words

today
automobile
freeways
highway
streetcars
railroads
airplanes
whenever
everyone's

638

Name ____________________

Use HOMONYMS to do this puzzle.



1 down and 5 across: not fancy, something that causes air pollution.
2 down and 16 across: you do it with a pencil, not wrong.
3 across and 8 down: what you do in church, hunted animals.
4 across and 20 across: part of the water cycle, a leather strap for horses.
5 down and 8 across: two of a kind; a fruit grown in California.
6 across and 19 down: complete; a place to put seeds.
6 down and 12 down: to use up our natural resources foolishly; a part of your body.
7 across and 13 across: uses a needle and thread; scatters seeds.
9 across and 9 down: freedom from war; a part of something.
10 down and 14 down: the blossom of a plant; used to make bread.
11 across and 14 across: a part of the chimney; past tense of fly.
13 down and 15 across: where all energy comes from; a father's boy.
17 down and 19 across: not there; to listen to.
18 across and 18 down: a large animal; how our forests will look if we keep cutting down the trees.

639

Name ____________________

DIRECTIONS: Synonyms are words that have the same, or almost the same, meaning. Use these words to write a synonym for each of the words below.

pollute save compromise litter squander
opinion population environment nuclear energy

1. conserve save
2. contaminate pollute
3. power energy
4. trash litter
5. atomic nuclear
6. belief opinion
7. surroundings environment
8. inhabitants population
9. meet halfway compromise
10. waste squander

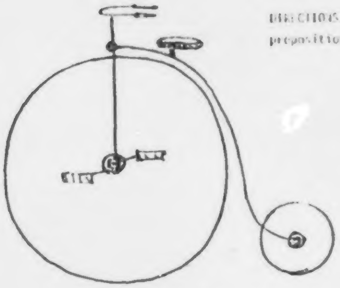
Use the first letter of the synonyms you write to find out "what has the greatest effect on our environment".

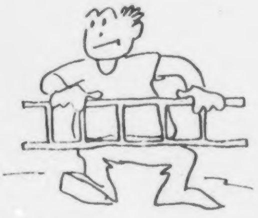
P E O P L E
2 7 6 8 4 3

640

Answers 637, 638, 639, 640

Name





DIRECTIONS: Draw a line under the prepositional phrases in each sentence.

1. The first bicycle was made of wood.
2. It was invented in Germany in 1834.
3. At first bicycles were called "hobby horses".
4. The first bicycle in America was made in 1877.
5. It weighed over 70 pounds and at that time cost $313.
6. By the turn of the century, bikes were widely used by everyone.
7. Most of the police departments had bicycle patrolmen who arrested 12 mile an hour "speedsters".
8. Nearly all modern improvements in the automobile can be traced to the development of the bicycle.
9. In the 1970's, the bike has again become a popular form of transportation.
10. It is non-polluting for our environment and only uses 'muscle power'.

642

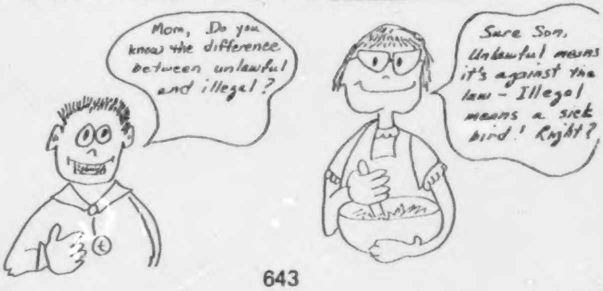
Name

A	L	A	W	S	B	C
D	I	G	I	A	W	X
C	C	R	L	C	A	R
X	E	W	D	T	T	P
R	N	O	I	S	E	O
O	S	M	O	G	K	O
S	E	I	T	T	O	B
O	S	P	W	D	A	W

DIRECTIONS: Complete the sentences by finding the missing word in the "word find". Write the word on the blank space to complete the sentence.

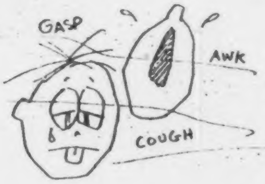
Protecting Our Environment

1. Many states have passed laws to protect our environment.
2. In California you can be fined $100 for throwing litter from a car.
3. Some states allow soda to be sold only in returnable bottles.
4. Hunting and fishing licenses are required to protect our wildlife.
5. There are laws to prevent factories from polluting the air or water with waste materials.
6. California requires smog devices on automobiles to lessen air pollution.
7. It is against the law to pick many wild flowers.
8. There are even laws against making too much noise.


Mom, Do you know the difference between unlawful and illegal?
Sure Son, Unlawful means it's against the law - Illegal means a sick bird! Right?

643

Name



DIRECTIONS: Draw a line through the incorrect form of the words in each sentence. Read the sentences again to make sure they are correct.

1. Air is (~~pollute~~, polluted) when it affects safety, comfort or health, or when it (prevents, preventing) people from using their property or community.
2. Two major (~~sources~~, source.) of air pollution are industry and transportation.
3. The (damage, ~~damages~~) from air pollution is estimated to cost each American about $65 a year.
4. Smog (~~smother~~, smothers) vegetation such as leaves, flowers, and food crops.
5. Polluted air (~~affect~~, affects) paint pigment causing it to discolor and peel.
6. Air pollution (~~discolor~~, discolors) textile dyes, (soil, soils) curtains, and (leaves, left) grime on everything.
7. Cattle have (~~die~~, died) from breathing polluted air.
8. Polluted air can (damage, ~~damages~~) tire casings and can (weaken, weakens) leather, glass, and paper.
9. Air pollution can (cause, ~~causes~~) higher electric light bills by blocking out the sun and darkening the day.
10. Polluted air is one of the major (~~cause~~, causes) of lung disease such as emphysema and lung cancer.
11. Headaches, dizziness, coughing, shortness of breath, irritated eyes, and chest pains can all be (~~relate~~, related) to polluted air.
12. Polluted air (is, ~~are~~) expensive and dangerous for everyone.

644

Name

ZIP
ATOM TOP

DIRECTIONS: These words that are associated with nuclear energy are hidden in the sentences below. Find the words and draw a circle around them.

WASTE RADIOACTIVE FUSION CORE
REACTOR BREEDER FISSION ATOMIC
STORAGE

1. Joe and Bill are actors in the school play.
2. Sally thought the cause of the damage was termites.
3. Have you heard the new radio act I've made up?
4. It had better be terrific or Ed will have to look for a new job.
5. Since there were three of us, I only needed fifty cents.
6. Give a banana to Michael, please.
7. When the coke went 'fiss', I only lost half of it.
8. Did Bob Reed erase the board?
9. Did you buy a daisy first or a geranium?

Write the words in the correct column. Divide them into syllables.

One syllable	Two syllables
waste	storage
core	breeder
	fusion
Three syllables	fission
reactor	Five syllables
atomic	radioactive

645

Answers 642, 643, 644, 645

We know that most of the energy we use today comes originally from the sun. Put numbers in front of the following sentences to show the order in which they happen.

Fossil Fuel Energy

3 Heat and pressure over a long period of time change decaying plants and animals into coal, oil, and natural gas.
1 Light and heat from the sun provide life materials for growing plants and animals.
5 Fossil fuels are refined to provide energy for machinery.
2 Plants and animals die and decay.
4 Man drills wells and digs deep into the earth to uncover fossil fuels.

Hydroelectric Energy

5 Turbines generate electricity for power.
3 Rain falls and fills rivers and streams.
1 Heat from the sun evaporates water from oceans and lakes.
2 Evaporated water forms rain clouds.
4 Dams on rivers trap water and use water flow to turn turbines.

Wind Energy

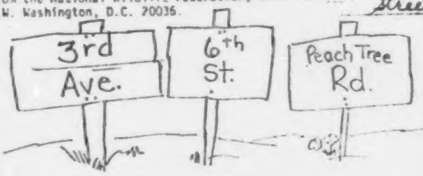
1 Heat from the sun warms the air.
4 Windmills can be used to pump water or generate electricity.
2 As warmed air rises, cold air fills its space causing wind currents.
3 Moving wind turns large blades on windmills.

646

Name

DIRECTIONS: On the line at the right of each sentence write the word that the underlined abbreviation stands for.

1. Environmental license plates are obtained through the Dept. of Motor Vehicles. Department
2. The address of the National Audubon Society is 950 Third Ave., New York, New York. Avenue
3. You can get free conservation materials from the U. S. Government Printing Office. United States
4. The Sierra Club in Calif. is concerned with the protection of our environment. California
5. Some states, like Ore., have passed laws so that beer and soda can only be sold in returnable containers. Oregon
6. The first bikeway marked with signs was established in Homestead, Florida, in Aug. 1962. August
7. The Pres. of the United States gives a special award to students who organize and conduct environmental projects. President
8. Ecology Action Packs are available from McDonalds, P.O. Box 2344, Kettering, Ohio 45429. Post office
9. Dr. Seuss wrote a book about man's effect on his environment called "The Lorax". Doctor
10. You can get information about endangered animals from the National Wildlife Federation, 1412 16th St., N.W. Washington, D.C. 20036. Street



647

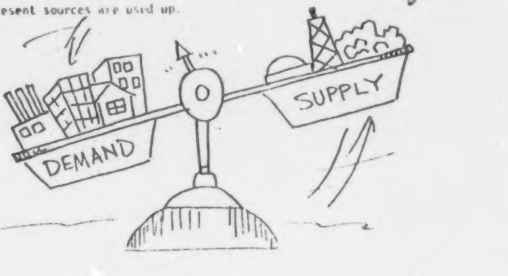
Name

DIRECTIONS: Antonyms are words that have opposite meanings. Use the word box to write antonyms for the words in parentheses.

limited before conserve waste
more necessary future most

The Energy Balance - Supply and Demand

1. Today we are demanding more (less) more power for industry, homes and transportation.
2. Energy is (needless) necessary to operate all our machines.
3. Fossil fuels, like coal and oil, are our (least) most important sources of energy.
4. These fossil fuels are (everlasting) limited.
5. We must not (save) waste the amounts of fuels which are left.
6. Everyone should try to (waste) conserve energy whenever possible.
7. We also need to develop new sources of energy for the (past) future.
8. Our life style depends on finding these new sources (after) before our present sources are used up.



648

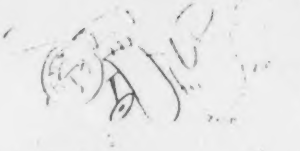
Name

DIRECTIONS: A fact is something known to be true or to have really happened. An opinion is something one thinks or believes. Write fact or opinion in front of each of the following statements.

fact 1. The world's population is continuing to increase.
opinion 2. In five years, there won't be enough food for everyone.
fact 3. Insects can destroy valuable food crops.
opinion 4. The use of pesticides is the biggest problem in our environment.
opinion 5. No one should ever use pesticides.
fact 6. Scientists are trying to develop alternate sources of energy.
fact 7. Nuclear energy is an alternative source of power.
opinion 8. Solar energy is our best hope for the future.
fact 9. Wind power has been used for years.
opinion 10. Solar heating is too expensive to use at this time.
opinion 11. In ten years, there may not be any oil left.
fact 12. Gasoline is made from oil.
fact 13. The faster a car goes, the more gas it uses per mile.
opinion 14. Geothermal power is better than hydroelectric power.
fact 15. Volcanoes are examples of geothermal power.
opinion 16. If everyone would stop using electric toothbrushes, we would have enough extra electricity to last ten more years.

649

Answers 646, 647, 648, 649



Name

Airplanes are a form of mass transit. Although they carry large numbers of people, they also emit dirt and waste gases into the air. This polluted air can easily be seen near airports as planes take off and land.

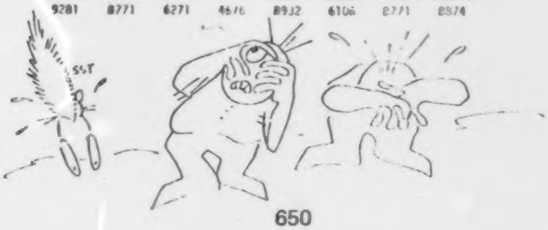
DIRECTIONS: Use the problems to answer the riddle at the bottom of the page.

4823 + 1448 6271 O	6198 + 2734 8932 H	3866 + 5008 8874 S	2967 + 3139 6106 E	7403 + 1878 9281 B
2455 + 6316 8771 R	1198 + 3478 4676 T	4119 + 3981 8100 N	5025 + 1986 7011 W	7342 + 1874 9216 G

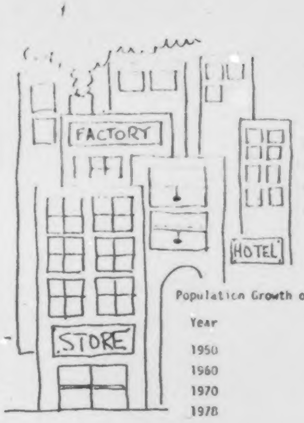
WHO INVENTED THE FIRST AIRPLANE THAT DIDN'T FLY?

T	H	E	W	R	O	N	G
4676	8932	6106	7011	8771	6271	8100	9216

B	R	O	T	H	E	R	S!
9281	8771	6271	4676	8932	6106	8771	8874



650



Name

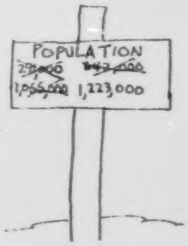
Although growth in Santa Clara County has slowed somewhat in recent years, it is still one of the fastest growing areas in California and possibly in the country.

DIRECTIONS: Use the chart to answer the questions.

Population Growth of Santa Clara County

Year	Population Size
1950	291,000
1960	642,000
1970	1,065,000
1978	1,223,000

1. How many more people lived in Santa Clara County in 1960 than in 1950? 351,000
2. How many more people lived in the County in 1970 than in 1960? 423,000
3. How many more people were there in the County in 1978 than in 1970? 158,000
4. How many more people lived in the County in 1978 as compared to 1950? 932,000
5. Which ten year span had the greatest growth in population? 1960-1970



651

Name

We know that fossil fuels (oil, coal and natural gas) are a limited source of energy. The faster we use them, the sooner they will be gone. We need to find alternate sources of energy.

What are three sources of energy that are not fossil fuels?

DIRECTIONS: Find the answer by following the directions of each sentence.

On spaces numbered	
5 and 20	-- If 35 - 7 is the same as 20 + 8, put R. If not, put W.
8 and 13	-- If 3 X 5 is the same as 5 X 3, put D. If not, put I.
6	--- If 56 ÷ 8 is the same as 8 X 8, put O. If not, put T.
16	--- If 200 - 99 is the same as 10 + 1, put N. If not, put C.
3, 10 and 17	- If 26 + 26 is the same as 50 + 2, put L. If not, put A.
1	--- If 6 X 4 is the same as 3 X 8, put S. If not, put T.
7	--- If 99 ÷ 9 is the same as 9 + 1, put M. If not, put I.
12 and 14	-- If 4 X 5 is the same as 100 ÷ 5, put N. If not, put S.
2	--- If 3 + 1 is the same as 3 X 1, put A. If not, put O.
18	--- If 73 - 42 is the same as 23 + 6, put E. If not, put Y.
15	--- If 40 X 0 is the same as 5 X 0, put U. If not, put O.
4, 9, 11, 19	- If 100 ÷ 10 is the same as 980 - 970, put A. If not, put P.

Three sources of energy that are not fossil fuels are:

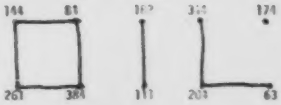
S	O	L	A	R.	T	I	D	A	L.	A	N	D
1	2	3	4	5	6	7	8	9	10	11	12	13

N	U	C	L	E	A	R.
14	15	16	17	18	19	20

652

Name

The last fossil fuel to be developed as an energy source was???
(We've only used it for the last 100 years!)



Find out . . .

Connect answer 4 with answer 5.
Connect answer 7 with answer 9.
Connect answer 3 with answer 8.
Connect answer 2 with answer 1.
Connect answer 1 with answer 5.
Connect answer 4 with answer 2.
Connect answer 9 with answer 6.

1. 18) 6912 = 384	2. 92) 7728 = 84	3. 36) 6552 = 182
4. 55) 7920 = 144	5. 34) 8874 = 261	6. 74) 4662 = 63
7. 26) 8944 = 344	8. 62) 6882 = 111	9. 43) 8772 = 204

653

Answers 650, 651, 652, 653

Name

Many people object to nuclear energy because of the unsolved problem of what to do with the radioactive waste products. At the present time, these radioactive wastes are usually stored in thick lead boxes which are buried deep underground or dumped into the ocean.

These radioactive wastes are very dangerous and it takes a long time before they lose their radioactivity. The length of time it takes is measured in half-life. Each radioactive element has a different half-life.

Example of an element with a half-life of 10 years:

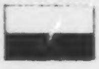
Original amount stored - 20 pounds	
Ten years later	10 pounds still radioactive
Ten years later	5 pounds still radioactive
Ten years later	2 ½ pounds still radioactive
Ten years later	1 ¼ pounds still radioactive

How many years will it take till 1 ¼ pounds of waste is still radioactive? 40 years

DIRECTIONS The half-life of radium is 1600 years. Using this information, write the correct year next to each box.

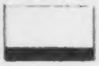
RATE OF RADIOACTIVE DECAY - RADIUM

Radium stored in 1979



After 1600 years, half the radium atoms have broken down.

What year is it? 3579



After another 1600 years, half the radium atoms have broken down.

What year is it? 5179

After another 1600 years, half the radium atoms have broken down.

What year is it? 6779

Uranium, which is the radioactive element used to make nuclear energy, has a half-life of 700,000,000 years!

Name

DIRECTIONS: Read the story. Use standard notation to answer the questions below.

Wildlife Preserves

Many years ago, people realized that something had to be done to protect animals and birds that were becoming endangered. Many of these animals were in trouble because man had built roads and cities where they lived. Our government passed tax laws to raise money in order to buy land where these animals could live safely. These wildlife preserves became permanent homes where wild animals are protected, and where they can find food and shelter and bear their young.

The Fish and Wildlife Service of the United States Department of the Interior is in charge of two hundred and sixty-four National Wildlife Refuges with a total area of nine million five hundred forty-six thousand six hundred and forty-six acres. Seventeen additional refuges exist in Alaska, Hawaii and Puerto Rico. One hundred and ninety-nine of the refuges are set up mainly for birds that live in or near water. Forty-one are for birds not normally hunted. Seventeen are for big game animals. And six are for birds other than waterfowl.

These wildlife preserves have saved many animals that might have become extinct.

1. How many National Wildlife Refuges are there in the United States? 264
2. How many acres are being used for this purpose? 9,546,646
3. How many refuges exist in Alaska, Hawaii and Puerto Rico? 17
4. How many refuges are used for birds that live in or near water? 199
5. How many refuges are for birds that are not normally hunted? 41
6. How many refuges are for big game animals? 17

Name

Roy and his friends are selling some of their old toys at a flea market. This is one way of recycling materials and preventing waste.

DIRECTIONS. Change the numbers to dollars and cents. Add up their sales.

Roy	
A box of hot wheel cars-3 dimes, 1 nickle, 2 pennies	$ .37
Hardy Boys game = 1 quarter, 1 nickle, 4 pennies	.34
Puzzles = 1 dollar, 1 dime, 6 pennies	1.16
Darth Vader mask = 2 quarters, 6 pennies	.56
	$2.43

Harold	
Box of comic books = 1 dollar, 2 quarters, 1 nickle	$1.55
Slightly used math book - 1 dime, 3 pennies	.13
Lincoln log set = 1 quarter, 1 dime	.35
	$2.03

John	
1 fish bowl - 1 nickle, 4 pennies	.09
53 guppies - 1 dollar, 4 dimes, 1 nickle	1.45
Bike wheel = 3 quarters, 1 dime	.85
Barbie doll (his sister's) -6 dimes, 11 pennies	.71
	$3.10

David	
1 pair skates = 1 dollar, 1 quarter, 1 dime	$1.35
6 baseball cards = 5 nickles, 5 pennies	.30
Nerf football = 3 quarters, 2 dimes, 1 nickle	1.00
	$2.65

Who made the most money? John did

Name

The National Wildlife Federation has started a paper recycling program in their company offices. Each employee has a tray on their desk to hold used papers. The used papers go from the trays to boxes instead of into the wastebasket.

Their goal is to save four tons of used paper for recycling.

DIRECTIONS: Do the word problems below.

1. The NWF goal is to save four tons of used paper. Each box weighs 50 pounds when it is full. How many boxes will they need to make four tons?

$$\begin{array}{r} 160 \text{ boxes} \\ 50\overline{)8000} \\ \underline{50} \\ 300 \\ \underline{300} \end{array}$$

2. Each 1000 pounds of paper that they collect will save 8.5 trees. If they reach their goal of four tons, how many trees will be saved?

$$\begin{array}{r} 8.5 \\ \underline{8} \\ 68.0 \text{ trees} \end{array}$$

3. The four tons of used paper will be recycled and made into copier paper. Recycling one ton of waste paper uses 22,000 kilowatt hours of energy. Producing the same amount of paper from trees takes 67,000 kilowatt hours. How many kilowatt hours of energy will be saved by recycling four tons of waste paper?

$$\begin{array}{r} 67,000 \\ \underline{22,000} \\ 45,000 \end{array} = 1 \text{ ton} \qquad \begin{array}{r} 45,000 \\ \underline{4} \\ 180,000 \end{array}$$

Kilowatt hours of energy will be saved by recycling 4 tons

(This is enough to air condition and heat two average houses in Washington, D.C. for an entire year!)

Name ____________

DIRECTIONS: Do the problems. Remember to reduce your answers to their lowest terms.

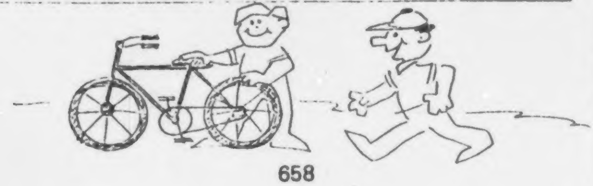
Use the code to find two methods of transportation that save energy and natural resources.

Code Box

$\frac{1}{2}$ A	$\frac{1}{3}$ B	$\frac{1}{4}$ D	$\frac{2}{3}$ I	$\frac{3}{4}$ W	$\frac{3}{7}$ N	$\frac{3}{5}$ K
$\frac{1}{6}$ M	1 = G	$\frac{4}{5}$ = E	$\frac{2}{5}$ = O	$\frac{5}{6}$ = R	$\frac{6}{7}$ = L	$\frac{1}{8}$ = P

$\frac{1}{6}$	$\frac{2}{12}$	$\frac{4}{10}$	$\frac{8}{20}$	$\frac{2}{6}$	$\frac{1}{6}$	$\frac{1}{8}$	$\frac{4}{9}$	$\frac{3}{14}$	$\frac{5}{20}$
$+\frac{1}{6}$	$+\frac{6}{12}$	$+\frac{2}{10}$	$+\frac{8}{20}$	$+\frac{3}{6}$	$+\frac{3}{6}$	$+\frac{1}{8}$	$+\frac{2}{9}$	$+\frac{3}{14}$	$+\frac{15}{20}$
$\frac{1}{3}$	$\frac{2}{3}$	$\frac{3}{5}$	$\frac{4}{5}$	$\frac{5}{6}$	$\frac{2}{3}$	$\frac{1}{4}$	$\frac{2}{3}$	$\frac{3}{7}$	1
B	I	K	E	R	I	D	I	N	G

$\frac{1}{4}$	$\frac{1}{7}$	$\frac{1}{12}$	$\frac{4}{8}$	$\frac{1}{10}$	$\frac{2}{7}$	$\frac{4}{10}$	$\frac{7}{15}$	$\frac{2}{21}$	$\frac{3}{4}$
$+\frac{1}{4}$	$+\frac{2}{7}$	$+\frac{2}{12}$	$+\frac{2}{8}$	$+\frac{4}{10}$	$+\frac{4}{7}$	$+\frac{2}{10}$	$+\frac{3}{15}$	$+\frac{7}{21}$	$+\frac{1}{4}$
$\frac{1}{2}$	$\frac{3}{7}$	$\frac{1}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{6}{7}$	$\frac{3}{5}$	$\frac{2}{3}$	$\frac{3}{7}$	1
A	N	D	W	A	L	K	I	N	G



Name ____________

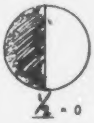
In California, the largest source of air pollution is the automobile.

The California State Air Resources Board has adapted many new requirements which will reduce air pollution and also improve car mileage.

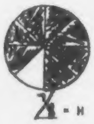
California requires smog control devices on all automobiles sold in the state. It is the first state to do so.

Car manufacturers are also trying to improve cars so that they are less polluting and don't use as much gasoline. Some Volkswagen cars, for example, can go almost 50 miles on one gallon of fuel.

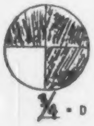
DIRECTIONS: What part of the whole figure is shaded? Use your answers to solve the riddle.



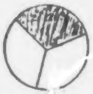
$\frac{1}{2}$ = O



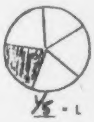
$\frac{7}{8}$ = H



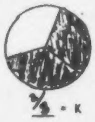
$\frac{3}{4}$ = D



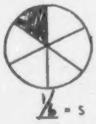
$\frac{1}{3}$ = E



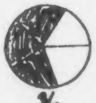
$\frac{1}{5}$ = L



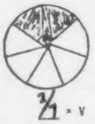
$\frac{2}{3}$ = K



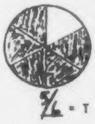
$\frac{1}{6}$ = S



$\frac{3}{5}$ = M



$\frac{2}{7}$ = V



$\frac{5}{6}$ = T

WHERE DO OLD VOLKSWAGENS GO?

T	O	T	H	E	O	L	D
$\frac{5}{6}$	$\frac{1}{2}$	$\frac{5}{6}$	$\frac{7}{8}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{5}$	$\frac{3}{4}$

V	O	L	K	S	H	O	M	E
$\frac{2}{7}$	$\frac{1}{2}$	$\frac{1}{5}$	$\frac{2}{3}$	$\frac{1}{6}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{3}{5}$	$\frac{1}{3}$

Name ____________

The faster a car goes, the more gas it uses per mile. At 50 MPH (miles per hour), gas mileage will be 20 to 25% less than at 70 MPH.

DIRECTIONS: Find the answers to the following problems.

Mike is planning a trip to Lake Tahoe. It is 240 miles from San Jose where he lives. When he drives 70 MPH, his car gets 15 miles to each gallon of gas. How many gallons of gas will he need to get there if he drives this fast?

16 gals.

```
    16
15 )240
    15
     90
     90
```

At 50 MPH, his car can get 20 miles to each gallon of gas. How many gallons of gas will he need to get to Lake Tahoe if he drives at 50 MPH?

12 gals.

```
    12
20 )240
    20
     40
     40
```

How many gallons of gas will he save if he drives at 50 MPH instead of 70 MPH?

```
  16
- 12
   4 gals.
```

At today's price of $1.09 per gallon, how much money will he save?

```
 $1.09
     4
 $4.36
```

Name ____________

Twenty-five percent of all the energy used in the United States goes for transportation. This is ¼ of all our energy needs!

DIRECTIONS: Reduce the fractions to their lowest terms. Use your answers to solve the riddle.

$\frac{6}{8} = \frac{3}{4}$ = N	$\frac{4}{24} = \frac{1}{6}$ = R	$\frac{2}{6} = \frac{1}{3}$ = H	$\frac{2}{18} = \frac{1}{9}$ = Y
$\frac{4}{6} = \frac{2}{3}$ = A	$\frac{1}{15} = \frac{1}{15}$ = P	$\frac{3}{6} = \frac{1}{2}$ = O	$\frac{12}{20} = \frac{3}{5}$ = T
$\frac{4}{10} = \frac{2}{5}$ = G	$\frac{2}{8} = \frac{1}{4}$ = I	$\frac{10}{100} = \frac{1}{10}$ = U	$\frac{6}{6} = 1$ = B

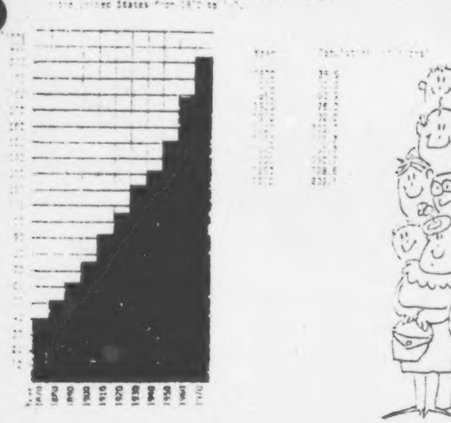
Extra weight uses more gas.
PUFF
CHUG
Speeds of 35 to 40 MPH save the most gasoline.

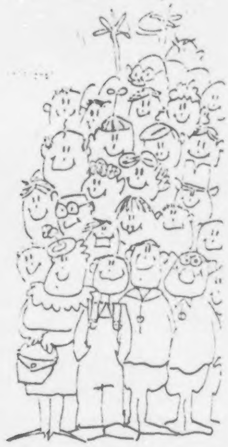
WHAT IS A HISTORY OF CARS CALLED?

A	N	A	U	T	O	B	I	O	G	R	A	P	H	Y
$\frac{2}{3}$	$\frac{3}{4}$	$\frac{2}{3}$	$\frac{1}{10}$	$\frac{3}{5}$	$\frac{1}{2}$	1	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{2}{5}$	$\frac{1}{6}$	$\frac{2}{3}$	$\frac{1}{15}$	$\frac{1}{3}$	$\frac{1}{9}$

Name

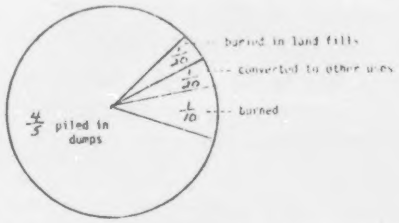
[illegible] the table to make a bar graph of the population growth [illegible] the United States from 1870 to 1970.





Name

Each one of us in the United States throws [illegible] ton of trash a year. This adds up to more than 360,[illegible] tons of trash a year in the United States. The circle graph below shows what happens to all this trash.



DIRECTIONS: Use the circle graph to fill in the blank spaces. Write your answers as percentages.

Where Does All the Trash Go?

80 % is piled in dumps.
10% is burned.
5% is buried in land fills.
5% is converted to other uses (including recycling).

Name

Matt has discovered a new book called Free Stuff for Kids. It has hundreds of things listed that kids can send for by mail.

Matt has written the addresses in expanded notation. Unfortunately, the post office will not accept mail addressed like this.

DIRECTIONS Change the numbers in the addresses to standard numerals. Write the corrected part of the address on the blank space.

1. The World Wildlife Fund is working to save wild animals from extinction. If you write to them, they will send you a free panda decal, penguin postcard and animal poster. Their address is:

World Wildlife Fund
Department LAN
One thousand six hundred and one Connecticut Ave. N.W
1601 Connecticut Ave. N.W.
Washington, D.C. Twenty thousand and nine
Washington, D.C. 20009

2. If you would like to recycle plastic containers and make fun things at the same time, write to the TEXIZE company for their Crafty Critters Folder. Their address is:

Consumers Relations Department
Box RB
TEXIZE
P.O. Box three hundred and sixty-eight
P.O. Box 368
Greenville, SC Twenty-nine thousand six hundred and two
Greenville, SC 29602

3. You can help save the world's natural resources by recycling aluminum cans and TV dinner trays. Reynolds Aluminum Company will send you a colorful comic book that tells you how sell the used aluminum containers back to them. Write to:

Recycling Public Relations Manager
Reynolds Metals Company
Box twenty-seven thousand and three
Box 27003
Richmond, VA Twenty-three thousand two hundred sixty-one
Richmond, VA 23261

Name

Transportation is a big problem in our environment. Today, in the United States, transportation uses 25% of all our energy. In California, automobiles are the number one source of air pollution. New highways and roads often result in loss of habitats for wild animals and plants.

Some people think that mass transportation is the answer. Trains and buses don't pollute the air as much as cars do. They use less fuel to carry more people and don't require as much space.

DIRECTIONS: Read the following. Answer the question.

. One railroad track can carry 72,000 people in one hour. A 3-lane highway can carry 6,000 people in one hour, if each car has 6 people in it.

1. How many people can a 3-lane highway carry in one hour if each car has only one person in it?

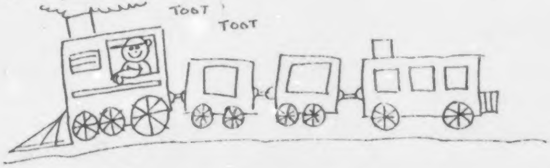
1,000

2. How many more people per hour can the railroad track carry than the 3-lane highway (with 6 people in each car)?

66,000

3. How many more people per hour can the railroad track carry than the 3-lane highway (with only 1 person in each car)?

71,000



4. You are the engineer on a train going from San Jose to New York. The trip will cover 4000 miles. There are 542 passengers on the train when it leaves San Jose. The train is going to make four stops on the way. At each stop, 50 people will get off and 75 people will get on the train. Use this information to find out 'how old the engineer is'.

The engineer is ____________ years old.

Name

This chart compares three kinds of transportation [illegible] cars, and trains. The plane and train are each [illegible] people. With [illegible] people in each car, 51 cars will also carry 360 people [illegible] is traveling [illegible]. The last column [illegible] fuel the plane, [illegible]?

Kind of Transportation	Miles Traveled	Number of Passengers	Gallons of fuel
1 plane	[illegible]	360 people	3,911 gallons
51 cars	[illegible]	360 people	3,316 gallons
1 train	[illegible]	360 people	1,238 gallons

DIRECTIONS: Figure out how much fuel each person uses when he travels by plane, train, or car. You can do this by dividing the number of people into the number of gallons each kind of transportation uses.

1. Traveling by plane?

$360\,\overline{)3911.00}$ = 10.86

2. Traveling by car?

$360\,\overline{)3316.00}$ = 9.21 40R

3. Traveling by train?

$360\,\overline{)1238.000}$ = 3.438 = 3.44

4. Traveling by cars carrying only 2 people in each car?

$180\,\overline{)3316.00}$ = 18.42

Which kind of transportation conserves the most fuel? Train

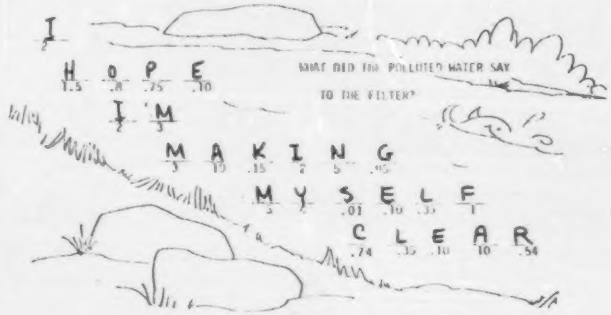
Which kind of transportation wastes the most fuel? Cars if only 2 people
Plane if cars have 4 people each

Name

In 19[illegible], the government passed the Water [illegible] Act Amendments [illegible] for the quality of water. [illegible] that water [illegible] pollution [illegible]

DIRECTIONS: Do the problems [illegible] the riddle.

Y 3.335 ÷ .66 = 40
I 3 ÷ 1.5 = 20
H 1.785 ÷ .255 = 15
C .18 + .6 = .74
Y = .05 X 3 = .15
P = .15 X 5 = .75
G 1 - .05 = .95
E = .04 + .06 = .10
F = .50 + .50 = 10
L = .75 - .4 = .35
N = .98 + 4.02 = 5.0
O = .33 + .47 = .80
S = 1 - .99 = .01
A = 50 X .2 = 10
K = .50 X 6 = 3.0
R = .678 - .068 = .54


WHAT DID THE POLLUTED WATER SAY TO THE FILTER?
I HOPE I'M MAKING MYSELF CLEAR
2 1.5 .8 .75 .10 2 3 3 10 .15 2 5 .95 3 .15 .01 .10 .35 1 .74 .35 .10 10 .54

Name

Many people do not understand what the energy crisis is all about. A recent study of 1,300 adults between the ages of 25 and 35 showed the following results.

DIRECTIONS: Find out how many people the percentages represent. First, change the percents to decimals. Then, multiply by 1,300 which is the actual number of people who answered the questions.

1. Only 46% of the people knew that crude oil produced the largest amount of energy used in the United States. How many people knew this?

46% = .46

1300 × .46 = 7800 + 5200 = 598.00

598 people knew that crude oil produced the largest amount of energy.

2. Only 14% of the people knew that coal is the main fuel source used to produce electricity. How many people knew this?

1300 × .14 = 5200 + 1300 = 182.00

182 people knew that coal is the fuel used most to produce electricity.

3. Just 16% of the people knew that gasoline can be made from coal as well as oil. How many people was that?

1300 × .16 = 7800 + 1300 = 208.00

208 people knew that gasoline can be made from coal.

4. Only 49% of the people knew that the fossil fuel we have the most of is coal. How many people knew this?

1300 × .49 = 11700 + 5200 = 637.00

637 people knew that coal is the largest reserve of fossil fuels.

5. Only 33% realized that Americans, who make up 6% of the world's population, use more than 30% of its energy. How many people realized this?

1300 × .33 = 3900 + 3900 = 429.00

429 people were aware [illegible] this much [illegible].

Name

In January 1978 the Bureau of Land Management published the results of a survey regarding the California desert lands. The survey asked people what they thought the California desert lands should be used for. Here are the results.

Idea	People in Favor
1. Places for use of off road vehicles like dune buggies and motorcycles	23%
2. Campgrounds	47%
3. Motels and restaurants	16%
4. Recreation such as amusement parks and sports facilities	30%
5. Mining	15%
6. Educational programs	46%
7. Protection of desert life and ecology	81%
8. Protection of areas of historic importance	67%
9. Protection of desert scenery and character	73%
10. Energy development (gas, oil wells, geothermal, solar)	45%

DIRECTIONS: List the ideas in the order that most people wanted.

1. Protection of desert life and ecology
2. Protection of desert scenery and character
3. Protection of areas of historic importance
4. Campgrounds
5. Educational Programs
6. Energy development (gas, oil wells, gethermal, solar)
7. Recreation such as amusement parks / sports facilities
8. Places for use of off road vehicles dune buggies motorcycles etal
9. Motels and restaurants
10. Mining

Name

Solar Energy

The energy from the sun can be used as an alternative source of power. The sun's energy comes to the earth in the form of light and heat. The sun's warmth can heat our homes, water, and even make electricity.

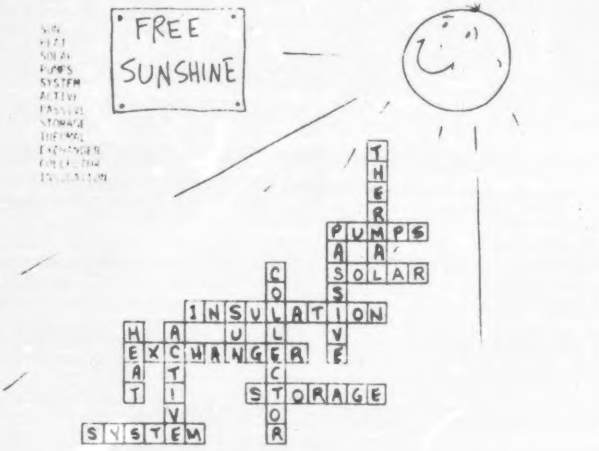
There are two basic types of solar energy used in the home. One is called "passive". The other is called "active".

A passive solar system is usually one where the sun's heat is used alone to heat water or living space. The sun's rays may shine through a window to warm a [illegible] or collectors to heat water. Pumps and other mechanical equipment are not needed.

An active solar system uses the sun's energy [illegible] in addition to the heat [illegible] pumps or other equipment to help move the heat or warmed water through the house.

DIRECTIONS: Fit these words associated with solar energy into the puzzle spaces below. Counting the letters and spaces will help you complete the puzzle.

SUN
HEAT
SOLAR
PUMPS
SYSTEM
ACTIVE
PASSIVE
STORAGE
THERMAL
EXCHANGER
COLLECTOR
INSULATION

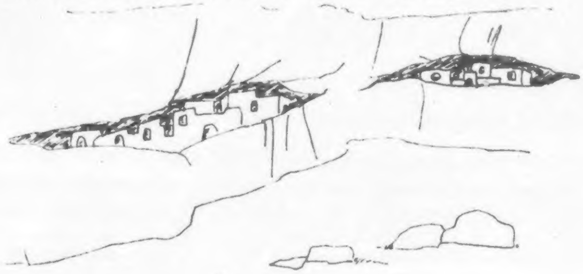


Name

The History of Solar Energy

The sun's energy has been used for heating and cooling for thousands of years. The early Greeks in the 5th century B.C. built entire cities facing south to take advantage of the sun's warming rays. A good example of early solar heating is in Mesa Verde, Colorado, where the Indians built their adobe homes in the cliffs of the mesa facing south. During the winter the sun would shine directly into the cliff dwellings and warm them naturally. The thick adobe walls stored the heat of the day. At night the stored heat would continue to keep the living space warm. During the summer when the sun was high, the overhanging cliffs shaded the structures to keep them cool. The Indians of Mesa Verde built their homes about 1200 A.D. Today, almost 800 years later, their natural heating and cooling system is still working.

In the early 1900's, fossil fuels and electricity were new kinds of energy used to provide heat for homes. When they were first used, they were very expensive, even more than they are today. Sunlight, on the other hand, was free. Solar water heating systems were introduced in California in 1891. The early models were simply shallow water tanks mounted on the roof of the house with plumbing leading to the kitchen and bathroom. In 1930, many rooftops in Los Angeles and other southern California cities had solar collectors. But as electricity, natural gas, and other fossil fuels became more readily available and dropped in price, the use of solar energy declined.



DIRECTIONS: Circle 'true' or 'false' for each statement.

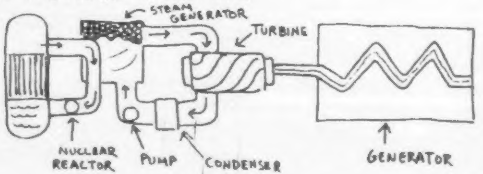
1. Solar energy is a new source of power. True [✓ False]
2. The sun was used to heat houses. [✓ True] False
3. Fossil fuels were expensive when they were first used. [✓ True] False
4. People stopped using solar power because it was too expensive. True [✓ False]

Name

Nuclear Energy

Nuclear energy is a source of power which does not depend on fossil fuels.

Here's how a nuclear power plant works.



The nuclear fuel (uranium 235) gives off heat which creates steam. The steam turns turbines which generate electricity.

Here are some reasons why people think this is a good source of energy.

- Nuclear power plants work on a small amount of fuel. One pound of nuclear fuel (uranium 235) the size of a golf ball can create as much energy as 1,500 tons of coal. Fuel transportation costs are minimum.
- Nuclear fuel is a clean source of energy. Because it does not burn, there is no smoke, soot or sulfur fumes to add to our air pollution problem.
- Nuclear fuel has only one use - to produce electricity. Oil, natural gas, and coal are used to produce many other products such as plastics and fertilizers. We should save these fuels for purposes for which there are no substitutes.

There are more arguments against the use of nuclear power than any other energy source. Do you know why?

DIRECTIONS: Use the story to fill in the blank spaces.

1. The fuel for nuclear power plants is uranium 235
2. Nuclear fuel heats water to make steam.
3. Steam turns turbines which generate electricity.
4. Nuclear power does not cause air pollution
5. Fossil fuels are needed to make many products such as plastics and fertilizers

---

Name

Alternate Sources of Energy

Here are seven kinds of energy which do not depend on fossil fuels.

solar tidal hydro wind
nuclear fission geothermal fusion

DIRECTIONS: Write the correct word on the space in front of each description.

wind	Used for hundreds of years. In areas where there are steady breezes, modern windmills can generate huge amounts of power. Free, quiet, and nonpolluting.
geothermal	Steam or boiling water is produced when water deep in the earth seeps over very hot rocks. Limited to areas where volcano-earthquake belts are found.
fusion	Unlike nuclear fission, uses no radioactive materials which could be used to make weapons. Cheap raw materials are found in seawater. Needs much scientific research.
solar	Nonpolluting, no noise and no waste. The sun's natural energy provides heat and light.
tidal	Created by the rise and fall of ocean waters. As tides change, water trapped in bays and reservoirs can be used to create electricity.
nuclear fission	Converts atomic energy into usable power. Heat produced in reactors powers turbines. Many problems in getting rid of radioactive waste materials.
hydro	Electricity produced by generators which are powered by rushing or falling water. Many dams have been built on fast moving rivers to produce power.

Answers 670, 671, 672, 673

Name

SAVE
CONSERVE N-R-G
I SAVE. DO YOU?

The Supply and Demand Problem

We know that the earth's supply of fossil fuels is limited. There is only so much coal, oil, and natural gas in the ground.

The problem is that we are using (demanding) more fossil fuels than we can produce (supply). It is estimated that the world will need as much oil in the next ten years as it has used in the last hundred.

Here in the United States, we already use more oil than we can produce. This means we must depend on other countries to supply our needs. We rely heavily on oil for gasoline, plastics, chemical products, and as the main energy source to produce electricity.

Many people are trying to solve this problem. Some are looking for new places to find oil. Others are trying to discover alternate sources of energy such as solar, hydro, wind, and nuclear power. We can all help by conserving the fossil fuels that we have. Using energy wisely will help to save these natural resources.

DIRECTIONS: Read the following facts. Use the back of your paper to answer the questions.

1. If everybody in America washed clothes in warm or cold water instead of hot, 150,000 barrels of oil could be saved daily.
   How can washing clothes in cold water save oil? You don't have to use energy produced by oil to heat the water.
2. In one month a television set uses the same amount of oil that it takes to make one gallon of gasoline.
   How can not using your television set save oil? You won't be using electricity, produced by oil, to run your television set

---

Name

The Energy Balance

The energy sources we're using today are limited, and we're using them up fast. If we want them to last until we develop new sources, we have to conserve what we have. There must be a balance between what we have and what we use. This is the energy balance of supply and demand. The supply is all the sources of energy we have now. The demand is all the things that use energy.

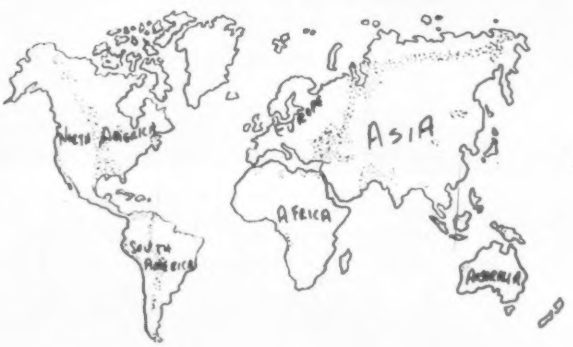
DIRECTIONS: Read the statements below.
If the statement affects the supply of energy, write S.
If the statement affects the demand of energy, write D.

S 1. Off shore drilling increases oil production.
D 2. Most families watch television about four hours a day.
S 3. Windmills are being used to generate electricity in many areas.
D 4. Five hundred new homes being built in foothills.
S 5. Strip mining for coal outlawed in many States.
D 6. Electric tooth brushes gain in popularity.
D 7. Average American family now owns two cars.
S 8. Alaskan pipeline carries oil from Alaska to continental United States.
D 9. New department store is completely air conditioned.
S 10. Experts predict we will run out of natural gas in less than thirty years.

Cross out the things below that are users of (demand) energy.

~~refrigerator~~ ~~automobile~~ coal ~~vacuum cleaner~~
sun ~~light bulb~~ ~~air conditioner~~ ~~radio~~
~~television set~~ water ~~stove~~ ~~airplane~~
~~elevator~~ silver ~~train~~ ~~telephone~~

Name

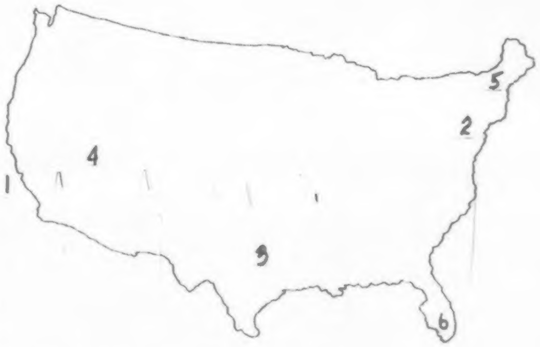


░ Oil producing areas

DIRECTIONS: Write the names on the continents.
Use the map to answer the questions.

1. What is the name of the large island that is not a continent?
   GREENLAND
2. What small continent has very little oil?
   AUSTRALIA
3. Which continents produce the most oil?
   ASIA and NORTH AMERICA
4. Compare North and South America; which produces more oil?
   NORTH AMERICA

Name



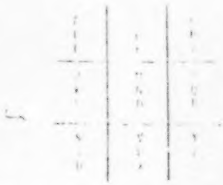
Pollution is caused by people.
When we pollute the air, water, or land, we are endangering ourselves and all other living things.

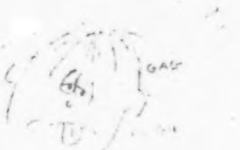
There is more pollution in cities than in the country. Do you know why?

DIRECTIONS: Here are some pollution problems that are happening in cities in the United States. Number the spaces on the map to show where these problems are located.

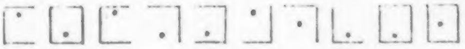
1. Oil spills have ruined many beaches off the shores of California.
2. Getting rid of garbage is a big problem for New York City.
3. Airplane exhaust is responsible for air pollution in Dallas, Texas.
4. Nuclear waste materials have been discovered in the air near atomic test sites in Nevada.
5. Water pollution due to factories dumping of pollutants into rivers is a problem in New Hampshire.
6. Signs and billboards are a visual pollution problem for Miami, Florida.

Answers 674, 675, 676, 677

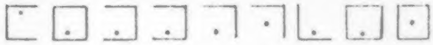




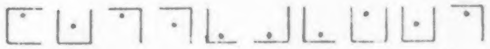
DIRECTIONS: Use this code to find three [illegible] at the shapes and positions of the letters. [illegible]



P O P U L A T I O N



P O L L U T I O N



P E S T I C I D E S

678

[illegible]

People have [illegible] the [illegible] population.

[illegible] larger and [illegible]

[illegible] diseases that [illegible] diseases.

They have also learned to greatly increase their food supply through farming. Pesticides have helped to increase food production.

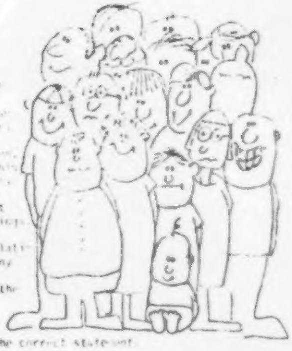
By controlling the environment around them, people have caused a population explosion. This increasing population is causing many problems for our environment.

More people are polluting the environment which we must share with all other living things.

People are finding it harder to produce enough food to keep up with the growing population.

Land space is becoming overcrowded in many cities.

People are beginning to understand that the Earth's resources are limited and that the population cannot keep increasing forever.



DIRECTIONS: Write these words in front of the correct statement.

overcrowding pesticides environment

ecology limited population

population The number of people living in a certain place at a certain time

environment What man has learned to control.

overcrowding What growing populations cause in cities.

pesticides These have helped people to increase food production.

limited What the Earth's resources are.

ecology The study of the relationships between living things and their environment.

If you write the first letter of each word, you will find out who causes population growth.

PEOPLE

679

Name

Transportation

Much of the energy used in the United States is used for transportation. The resource for this energy is oil, from which we make gasoline.

There are more than 100 million automobiles in the United States. An average car travels over 10,000 miles each year and uses more than [illegible] gallons of gasoline. Altogether, private cars use over [illegible] billion gallons of gasoline each year. That's about 4.[illegible] billion barrels of oil a day or about two thirds of the amount of petroleum currently being imported into the United States.

Every [illegible] can practice conservation in regards to transportation. If we use less gasoline, we will not need to import as much from other countries.

DIRECTIONS: Read the following statements about ways to conserve gasoline. If you think the statement is correct, write "true." If you think the statement is wrong, write "false."

true 1. Using public transportation, a [illegible], a moped, a bicycle, or walking will save gasoline.

true 2. Sharing a ride or joining a car [illegible] will save gasoline.

true 3. If every car in America took just one less 10 mile trip a week, the Nation would save 2[illegible] billion gallons of gas a year.

true 4. Driving at 55 miles per hour uses less gasoline than driving at 70 miles per hour.

true 5. A careful driver can get 20 percent more miles per gallon than the average driver and 50 percent more than a wasteful one.

TO THE CITY
2 MI

Read the message by writing the letter that comes just before the letter shown.

IF JUST 1 GALLON OF GASOLINE WAS

SAVED EACH WEEK BY EVERY CAR IN

AMERICA WE COULD SAVE ABOUT [illegible]

BILLION GALLONS OF OIL IN 1 YEAR

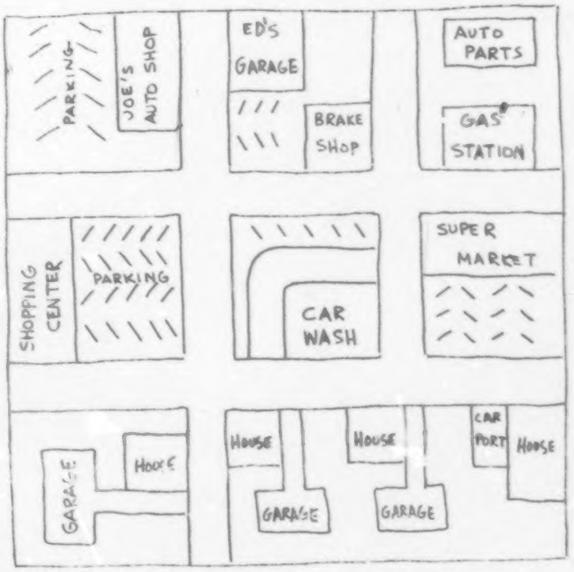
682

Name

Land Use and the Automobile

The automobile is an important part of our lives. We can go to more places and see more things because of the automobile. But, when most people use cars for moving around, many more roads must be built. More land is paved with asphalt and concrete for parking spaces. Gas stations and automobile repair shops take up more space. Most houses have garages for one, two, or three cars. In some cities, over half of the land is used for the automobile.

DIRECTIONS: Look at the map below. Color black all the areas that are used for automobiles.



683

Name

RECYCLING: One Pollution Solution

Recycling means to use waste materials over and over again so as not to use up all our natural resources.

DIRECTIONS: The paragraphs below tell about the process of recycling a car. They are not in the correct order. Put a number, one through six, in front of each paragraph to show the order in which they happen.

3 The steel is used in making a new car. The car dealer sells the new car.

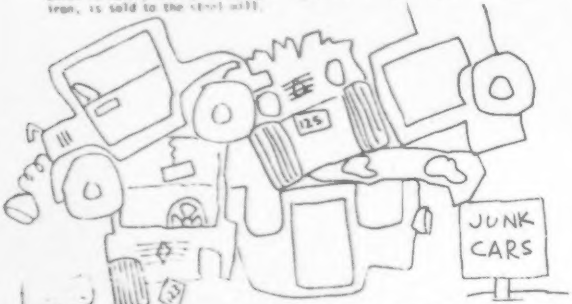
1 Metal ore is mined from the earth. To make an average car it takes: 7500 pounds of iron ore, 2500 pounds of coal and hundreds of pounds of copper, lead, zinc and aluminum ores.

4 The public buys the new car and uses it for about seven years.

2 The ore is shipped to a steel mill where it is processed to make steel.

6 Scrap steel is remelted and used in the process of making new steel.

5 When a car wears out it should be sold to an auto wrecker, who removes parts from the car which can be resold or rebuilt. The shell of the car, which is mostly steel, is cut up or squashed. The metal which contains iron, is sold to the steel mill.



Cars which are not recycled end up in ugly junk heaps or are just left to litter the landscape. Both ways are ugly and waste land. Nowadays, thankfully, most junked vehicles are recycled.

Name

[illegible] Our Environment

Our government has done many things to protect our environment. They have designated wilderness areas as National Parks and reserves so that all people may enjoy them. They have also passed laws to protect our wildlife and the environment. The Environmental Protection Agency (EPA) was established by Congress in 1970 to enforce the laws made by the government.

DIRECTIONS: Read the sentences below.
Put a 1 if you think this is a law.
Put a 2 if you think it should be a law.
Put a 3 if you think it should not be a law.

THERE OUGHT TO BE A LAW!
YEAH YEAH

1 It is unlawful to throw litter from a car.

1 In California, if you are over 15, you must have a license to fish or hunt.

3 People may not smoke cigarettes in their homes.

1 Cars purchased in California must be equipped with smog control devices.

1 Factories may not dump any waste materials into rivers.

2 Animal skins or furs may not be used to made clothing.

3 People may drive cars only if they carry at least three passengers.

1 Some local agencies can prevent signs and billboards from being put up on roadsides.

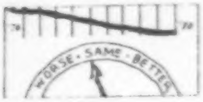
1 People may not pick or harm plants that have been designated as endangered.

3 Airplanes which give off fumes or gases that add to air pollution are not allowed to fly.

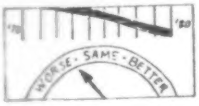
Name

National Wildlife is a magazine which you can probably find in your school library. It has many stories and information about plants, animals, and our environment. Every year, the magazine includes an up to date survey about our environmental problems. It is called a 'quality index'.

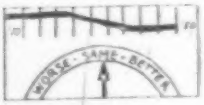
DIRECTIONS: Use the charts, which are printed in the February-March, 1980 issue of National Wildlife magazine, to answer the questions.



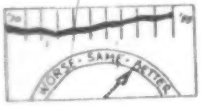
Wildlife



Minerals



Water



Air

1. Is the quality of our wildlife worse, the same, or better?

same

2. Which natural resource appears to be the same in quality for the last several years?

water

3. Which natural resource appears to be getting worse at the fastest rate?

minerals

4. Which natural resource is getting better in quality? Can you think of any reasons this might be so?

air - Smog control devices on cars. Laws.
Air quality control boards monitor industries

Name

People Working Together

There are many groups of people who are working together to protect our environment. Some are private groups which you can join. Others are public organizations which are supported by people through taxes.

DIRECTIONS: Read the descriptions of each group. Find the name of the organization by filling in the spaces with the letter that comes before the letter shown beneath.

1. This group was founded by John Muir in 1892. Muir believed that people should visit mountains, rivers, canyons, coasts, deserts, and swamps so that they could learn about, value, and protect them. John Muir helped to establish the first National Park.

The name of the group founded by John Muir is:

T H E S I E R R A C L U B
U I F T J F S S B D M V C

2. If you want to learn more about ecology and conservation, you can get many free materials from this organization. Their purpose is to create and encourage an awareness of the need for wise use and proper management of those resources of the earth upon which the lives and welfare of men depend: the soil, the water, the forests, the minerals, the plant life, and the wildlife.

The name of this organization is the

N A T I O N A L W I L D L I F E
O B U J P O B M X J M E M J G F

F E D E R A T I O N
G F E F S B U J P O

3. This international organization was started ten years ago. Its original purpose was to protest nuclear weapon testing in the atmosphere. Later they became involved with efforts to stop the killing of whales and baby harp seals. They are concerned with protecting all parts of our environment.

The name of this organization is:

G R E E N P E A C E
H S F F O Q F B D F

Name

DIRECTIONS: Read the questions carefully.
Think!
Write your answers in the spaces.

1. How often is the Annual Environmental Report published?
Annually

2. What is the Environmental Protection Agency (EPA) supposed to do?
Protect the environment

3. Who do public parks, like Yosemite National Park, belong to?
The public

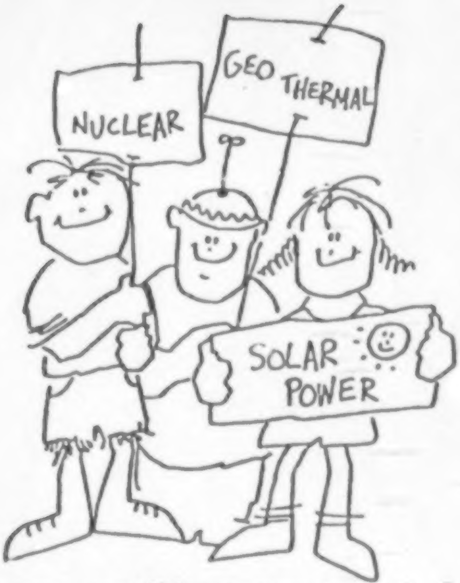
4. Which is better, atomic energy or nuclear energy?
Neither - both are the same thing

5. Can recycled materials be used again?
Yes

6. How much oil, coal, and natural gas will be left when we run out of fossil fuels?
None

7. Why can't we wait for more dinosaurs to die to make more fossil fuels?
Dinosaurs are extinct

8. If the world population increases by 170 people every 60 seconds, how many more people are there in the world every minute?
170



CONSERVATION FOR CHILDREN
Criterion Referenced Test (6)

Name ______________________

Date ______________________

DIRECTIONS: Read the questions. Write your answers on the spaces provided.

1. List seven possible energy sources for the future which do not depend on fossil fuels.

   1. *wind*
   2. *ocean tides (tidal)*
   3. *solar*
   4. *geothermal*
   5. *water (hydroelectric)*
   6. *nuclear fission*
   7. *fusion*

2. Write the names of three organizations that are concerned with protecting the environment.

   1. *Sierra Club, Greenpeace, National Audubon Society,*
   2. *National Wildlife Federation, Environmental Protection*
   3. *Agency, etc.*

3. The three main reasons for recycling materials are:

   1. *Saves energy*
   2. *Saves natural resources*
   3. *Prevents waste materials (trash build-up)*

4. Explain what is meant by the 'energy balance' of supply and demand.

   The demand for (or use of) energy must balance with the amount that can be produced.

5. Four effects of population growth on the environment are:

1. Loss of animal and plant habitats

2. Need for more food

3. More pollution

4. Amount of trash and waste materials is increased

6. Name three things that governments have done to protect the environment.

1. Passed laws to prevent polluting; Environmental automobile license

2. plates (provide money for environmental projects); designated certain

3. plants and animals as endangered; established wildlife preserves and refuges; created National Parks

7. What are three good things about using nuclear power?

1. Non-polluting

2. Small amount of uranium needed

3. Acquisition of fuel does not harm the environment; saves fossil fuels

8. What are three dangers in using nuclear power?

1. Storage of waste materials

2. Sabotage or theft, radioactive materials escaping or leaking.

3. High cost of building nuclear plants

9. Complete the sentences.

1. Twenty five percent of all the energy used in the United States is used for transportation.

2. The largest source of air pollution in California is automobiles.

3. The original source of energy is the sun.

10. List five ways we could save energy in regard to transportation.

1. walk, carpool, use mass transportation,

2. take fewer trips, drive slower, buy smaller cars,

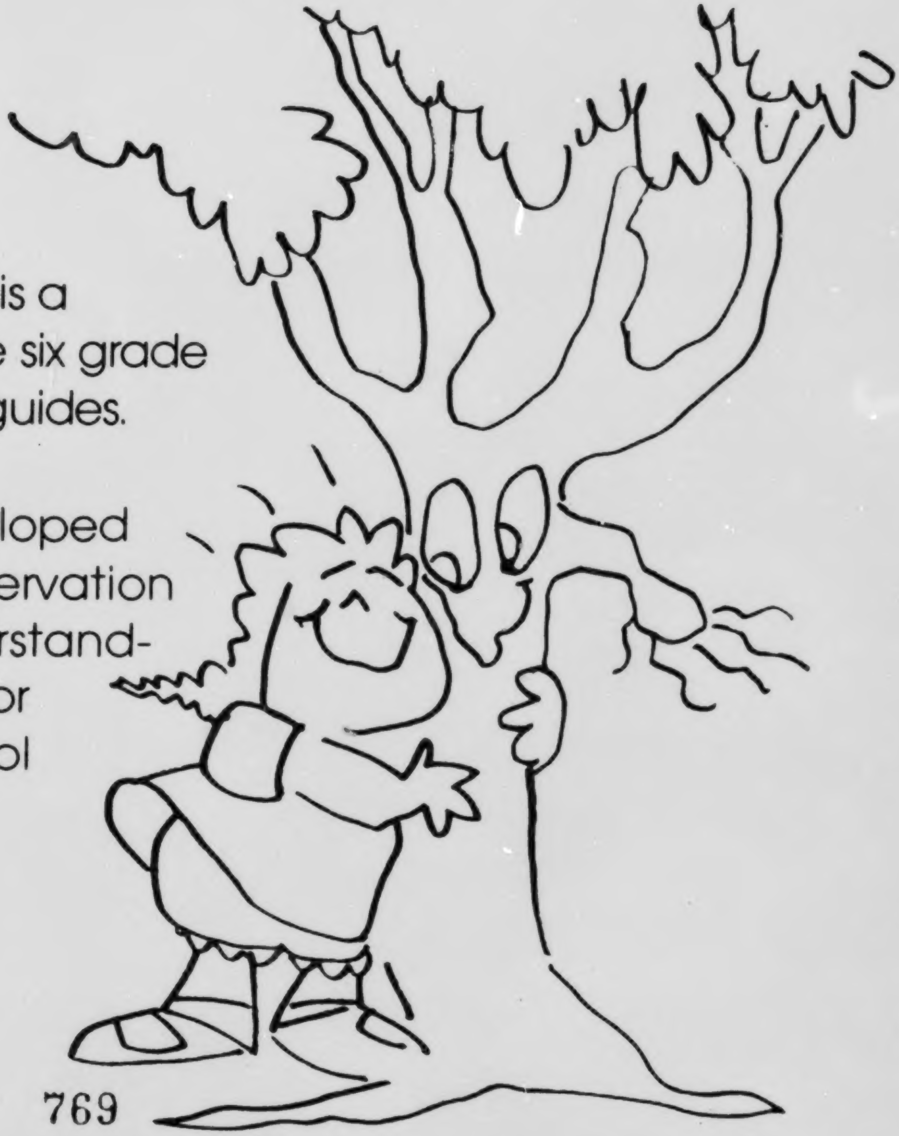
3. ride a bike, etc.

4.

5.

All Levels

Conservation For Children



This activity guide is a supplement to the six grade level sequenced guides.

It has been developed to promote conservation awareness, understanding and action for elementary school children.

An ESEA Title IV-C Project, Number 6298

Produced by Cupertino Union School District

John Muir Elementary School
6560 Hanover Drive
San Jose, CA 95129

408 252-5265

Carl W. Krause, Superintendent

Board of Education

Robert D. Hall, President

Severene Bylin

Roger C. Halstead

Valerie Harrison

Claire Hobbs

PROJECT STAFF

State Consultant: William A. Johnson

Associate Superintendent: William Zachmeier

Project Administrator, Principal: K.A. Fisk

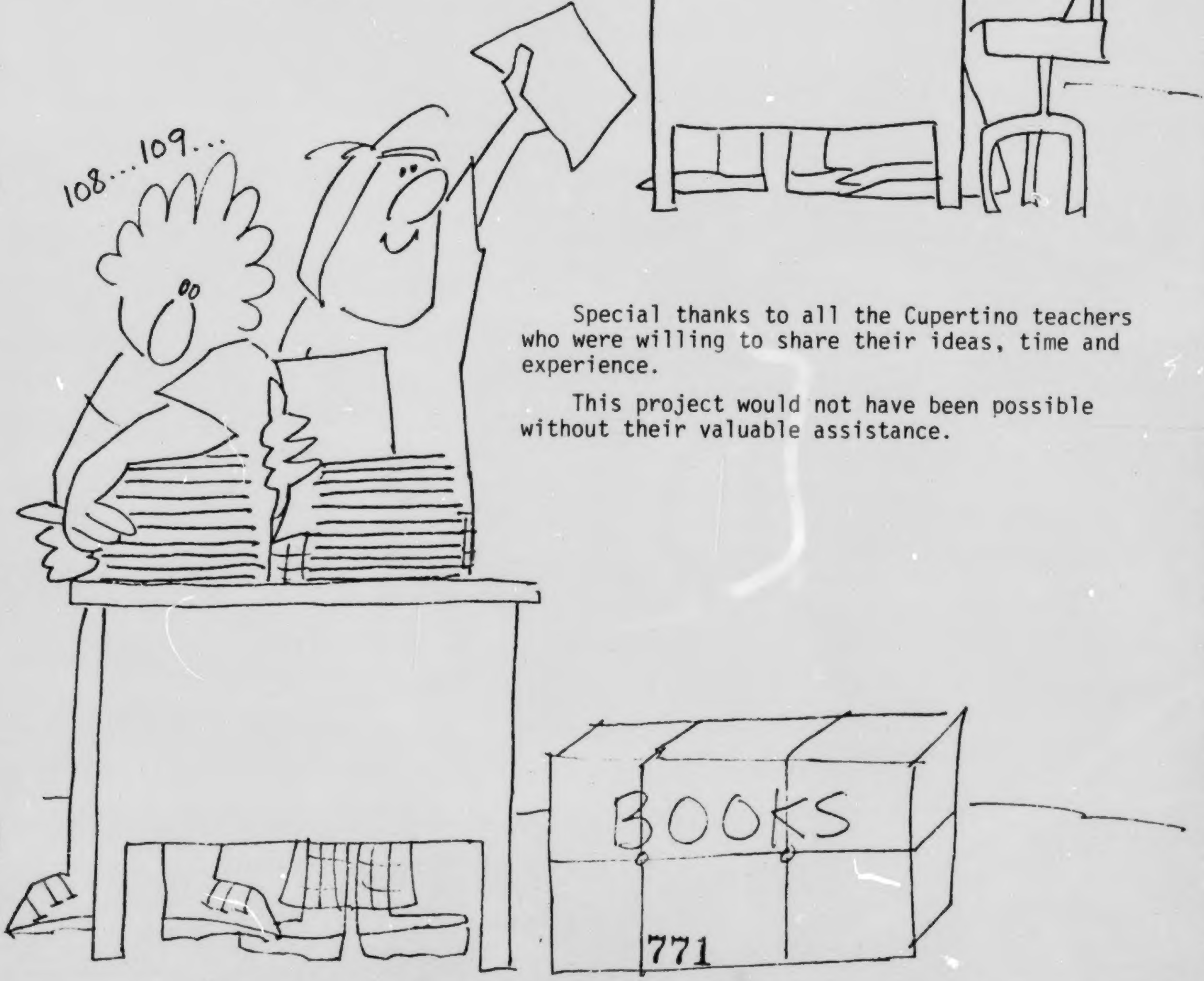
Director: Marilyn Bodourian

Program Clerks: Carole Kumaishi
Alice Ruick

Illustrator: Gen McKenzie

Evaluators: Lynn Fossum
Eloise Martin Appel

Consultants: Environmental Volunteers
Jane Hall



Special thanks to all the Cupertino teachers who were willing to share their ideas, time and experience.

This project would not have been possible without their valuable assistance.

These pages MAY be reproduced in whole or in part, by mechanical means - mimeograph, ditto, thermofax and others - with the permission and hope of the authors.

The pages in this book are printed on 100% recycled paper.

TABLE OF CONTENTS

Introduction 701

Conservation Calendar 702

Classroom Ideas 703

Arts and Crafts 705

Growing Plants 735

Music 755

Conservation Agencies and Local Groups . . . 765

Send Aways 767

Field Trips 775

Other Programs and Materials 785

Films 791

Student Bibliography
Books for pleasure and information 797

INTRODUCTION

PURPOSE:

The CONSERVATION FOR CHILDREN materials were developed to enable teachers to provide relevant conservation information for students in an easy and practical manner.

As our natural resources decline, both in quality and quantity, the importance of conservation education cannot be understated. As children become aware of environmental problems, they can better understand the precedents and consequences of such and their own interdependency with the environment. This knowledge will hopefully lead to positive action.

CONTENTS:

The previous six sequenced activity guides provide grade level student conservation worksheets in the areas of language arts, math, social studies, and science. These guides include grade level conservation concepts, criterion referenced tests, correlation tables, and student worksheets suitable for duplication.

This seventh 'All Levels' guide has been developed to expand student activities by offering ideas and suggestions for including conservation concepts in other areas of the curriculum.

Activities are included for arts and crafts, music, and growing plants in the classroom. In addition, reference lists of conservation agencies and groups, field trips, free and inexpensive materials, films, other programs, and a childrens' bibliography are also included.

The guide is intended as a resource for all grade levels.

CONSERVATION CALENDAR

Here are some dates to make your students aware of and observe in the classroom.

January 5 --- George Washington Carver Day
January 17 --- Benjamin Franklin's birthday (1706-1790)
February 11 -- National Inventors' Day
March 7 ---- Luther Burbank's birthday
March 15 ---- National Wildlife Week
March 19 ---- St. Joseph's Day (swallows return to Capistrano)
March 20 ---- National Energy Day
March 26 ---- Robert Frost's birthday (1874-1963)
April 21 ---- John Muir's birthday
April 22 ---- Arbor Day, Earth Day
April 26 ---- John James Audubon's birthday
May 3 ----- Sun Day
May 28 ----- Sierra Club first organized
May 31 ----- Walt Whitman's birthday
June 5 ----- World Environment Day
July 12 ---- Henry David Thoreau's birthday
July 20 ---- Moon Day (anniversary of 1st landing on the moon)
September 26 - John Chapman's (Johnny Appleseed) birthday
November 9 -- Smokey the Bear Day

GENERAL CLASSROOM IDEAS

Use or adapt some of the following ideas to create a 'conservation minded' classroom.

Encourage students to:

- Use both sides of the paper whenever possible.
- Reuse lunch sacks.
- Turn faucets off completely.
- Use only one paper towel to dry their hands.
- Turn off lights when not needed.
- Walk to school if possible.
- Use all materials wisely.
  (Teachers should remember to practice what they teach)

Plan classroom activities, such as:

- Make individual desk litter bags.
- Establish a classroom recycling area. Use ice cream cartons, one carton for 'tree products', one for 'minerals', etc.
- Use the following slogans for bulletin board titles (or make your own bumper stickers).
  Every Litter Bit Hurts!
  Earth: No Deposit, No Return
  Where Have All the Flowers Gone?
  Up With Trees
  Pitch In!
  Don't Be Fuelish
  Give a Hoot, Don't Pollute
  America the Beautiful?
  The More the Merrier? (population)
- Grow plants in the room. Buy a green stamp pad and give everyone a 'green thumb' to insure a good start.
- Have a recycling day to exchange old toys, games, books and other unwanted items.
- Take field trips to local conservation areas, museums, planetariums, and wildlife locations.
- Observe and discuss conservation dates, such as Earth Day, John Muir's birthday, and Sun Day. (Conservation Calendar, page 702)
- Make mystery puzzle bags. Put puzzle pieces in bag along with clue sheet. (Clue might read 'This animal is endangered because of over-hunting for it's fur. It lives in the grassland habitat.') Students put puzzle together to identify animal.
- Include conservation information in basic curriculum areas.
  Language Arts:
    Write letters to Congressmen, State representatives, businesses and local newspapers regarding ecology or pollution concerns.
    Survey library for books about conservation. Establish an 'ecology corner'.
    Debate conservation issues.
    Write anti-pollution songs and skits.
    Compose letters for 'send away' materials.

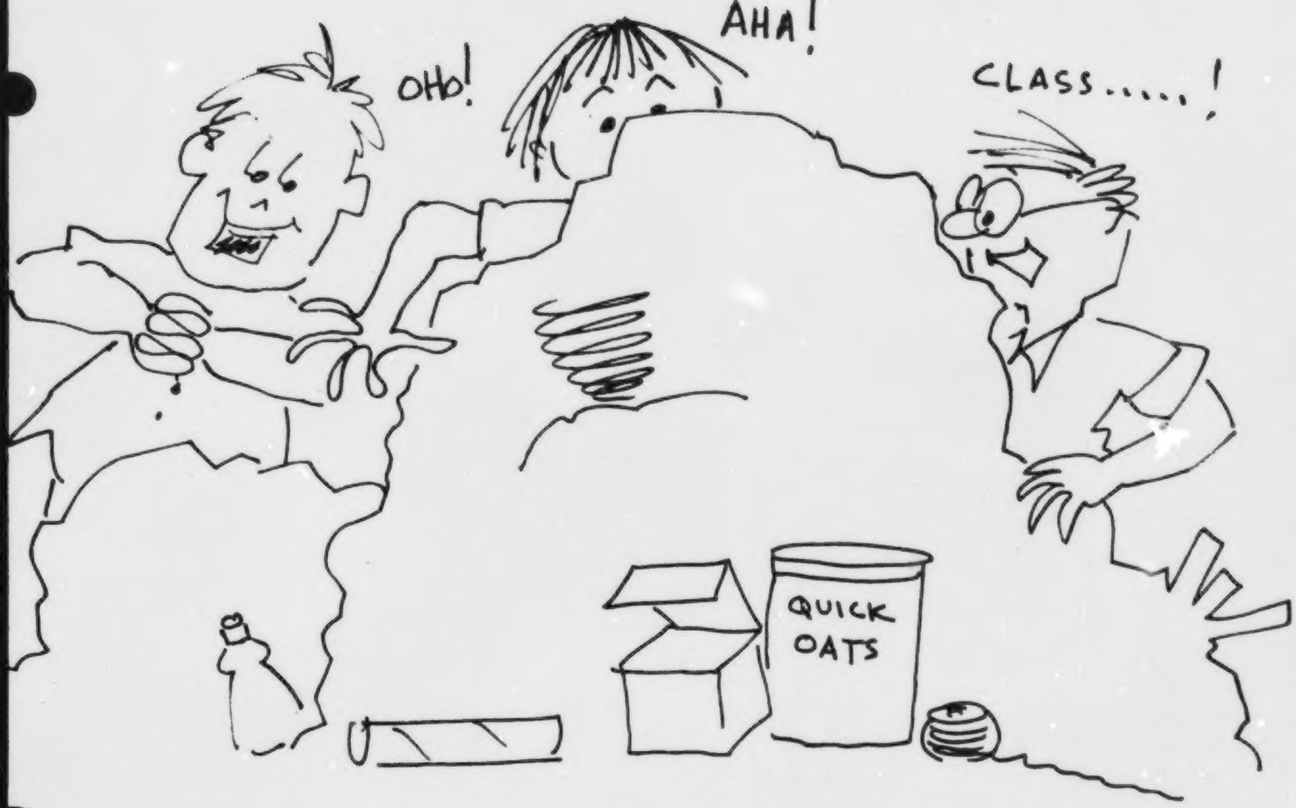
Math:
Calculate cost of paper used daily, monthly, for the year.
Learn to read gas, electric, and water meters.
Measure, chart, and graph plant growth.
Take student surveys regarding opinions on conservation issues, compute percentages or graph.
Learn to read and use thermometers.

Social Studies:
Invite speakers from the community organizations, private businesses and public agencies.
Collect newspaper articles dealing with conservation problems.
Show good films.

Art:
Construct junk art projects, mobiles, collages, etc. from litter and used articles.
Have an ecology poster contest. Display the posters in local shops.
Use recycled materials whenever possible.
Make paper sculptures or origami creations from school and district office memos. (One solution to paper pollution)
Use natural materials for dyes. Blueberries, onion skins, mint leaves, dandelion blossoms will all create colors when mixed with boiling water and a little vinegar.
Have a junk art contest.

Plan school activities, such as:

- Begin a community garden.
- Hold clean up contests.
- Develop an environmental study area.
- Have an environmental science fair.
- Establish a school recycling area.
- Plant trees, flowers, or shrubs.


OHo!
AHA!
CLASS.....!
QUICK OATS

ARTS AND CRAFTS

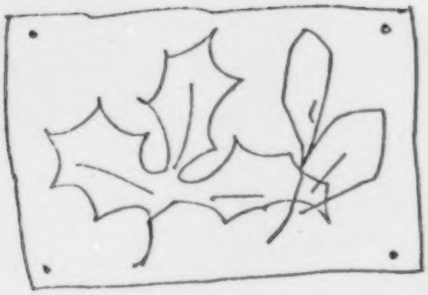
The classroom art period is an ideal time to reinforce the concept of conservation. It provides an opportunity to show students how to recycle 'useless' materials into arts and crafts treasures. Making projects from discarded or waste articles is also economical since materials cost little or nothing.

If space permits, encourage students to save items such as paper roll tubes, boxes of all sizes, Christmas cards, old game pieces, cans and jars. Styrofoam packaging materials, old wallpaper books, paint sample cards, lumber scraps, and many other throw away items can often be collected from local stores and used for craft projects.

The following projects are made from nature's materials, leaves, stones, flowers, etc., and/or discarded materials. They can be simplified or expanded to meet individual ability levels.

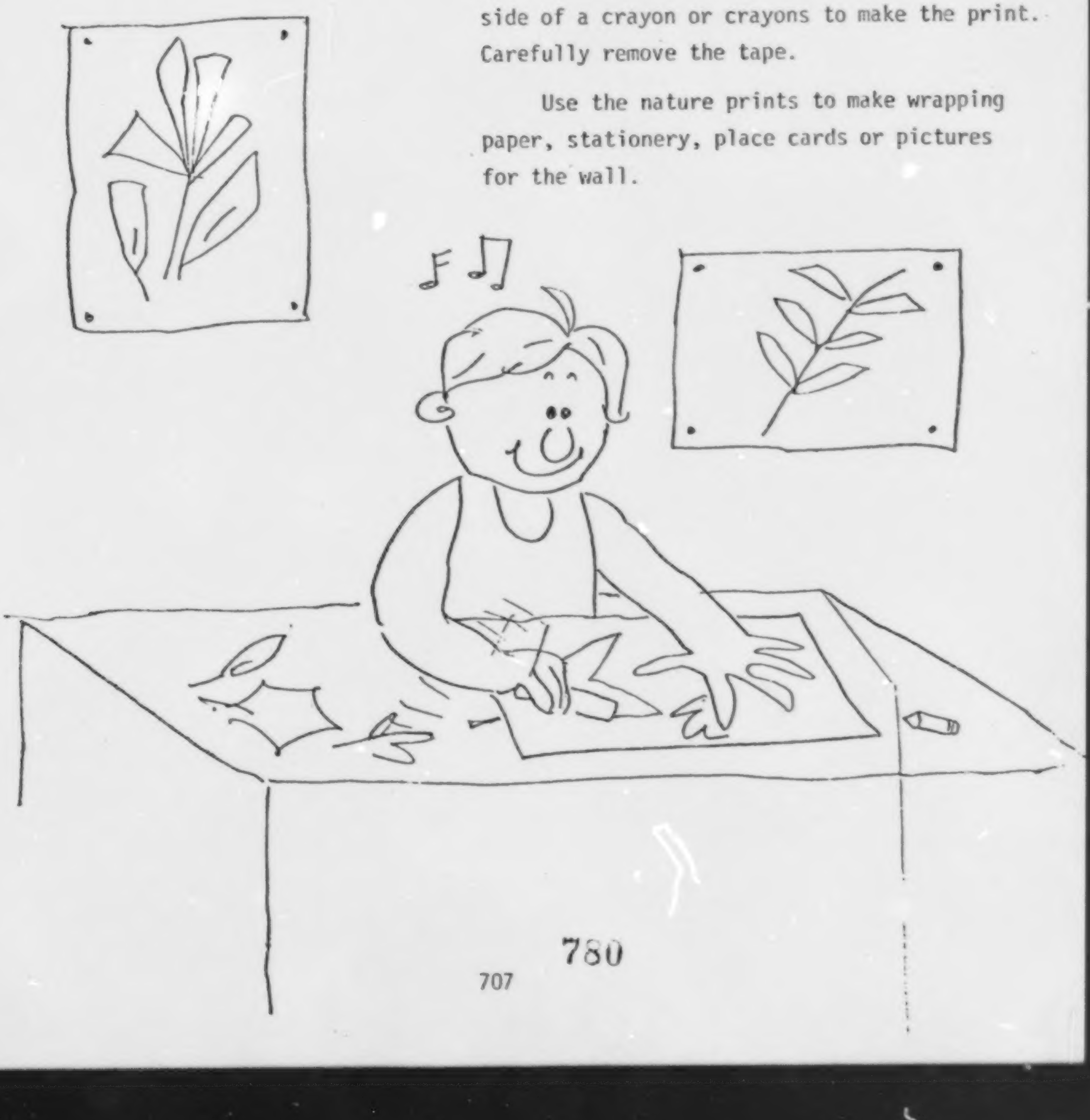
Page	Project	Suggested grade levels
707	Nature Prints	1 - 6
708	Leaf Skeletons	5 - 6
709	Leaf Print Tiles	1 - 6
710	Ceramic Leaves	1 - 6
711	Rock Animals	1 - 4
712	Pinecone Crafts	1 - 6
713	Garden Hats	1 - 4
714	Garden Markers	1 - 4
715	Scarecrows	1 - 6
716	Bird Feeders	1 - 6
717	More Bird Feeders	1 - 6
718	Paper Bag Masks	1 - 4
719	Making Recycled Paper	3 - 6
720	A Paper Tree	2 - 6
721	Egg Carton Jewelry	2 - 6
722	Walnut Shell Animals	1 - 6
723	Wind Chimes	1 - 6
724	Natural Flea Collars	5 - 6
725	Kitty Toy	3 - 6
726	Potpourri or Fragrance Jars	1 - 6
727	Monster Markers	1 - 6
728	Gourd Birds	5 - 6
729	Tin Can Lanterns	5 - 6
730	Crystal Gardens	3 - 6
731	Planetariums	4 - 6
732	Snow Scene Jars	5 - 6
733	Bibliography	

Nature Prints



Gather leaves, grasses, or flowers that have interesting shapes. Place a single leaf or a group of things on the desk, underside up. Cover it with a piece of paper. Tape the paper to the desk with masking tape. Rub over the leaf with the side of a crayon or crayons to make the print. Carefully remove the tape.

Use the nature prints to make wrapping paper, stationery, place cards or pictures for the wall.



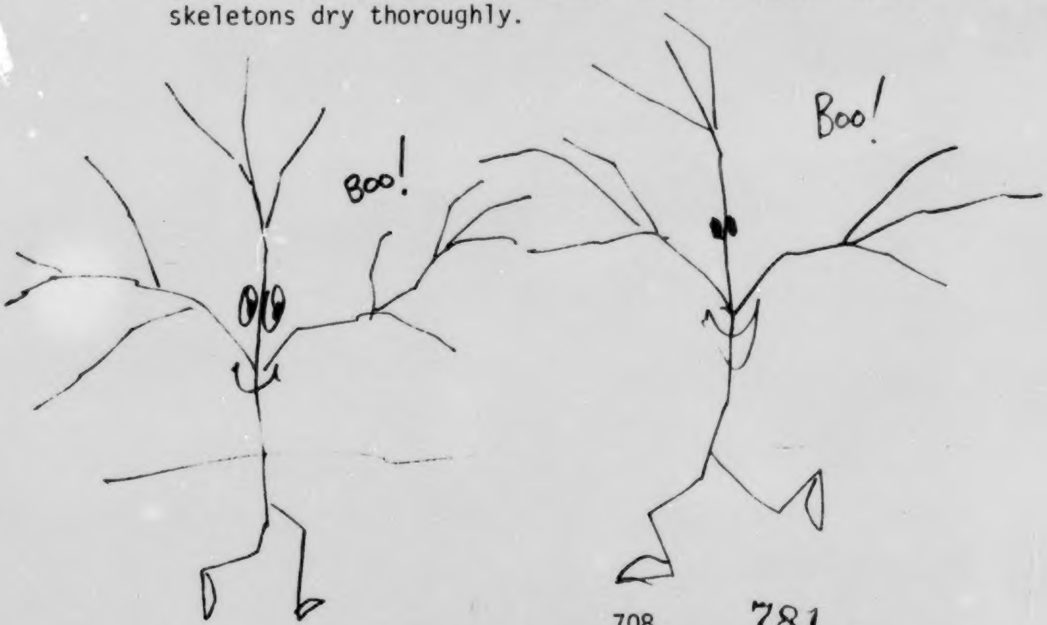
LEAF SKELETONS

Materials:

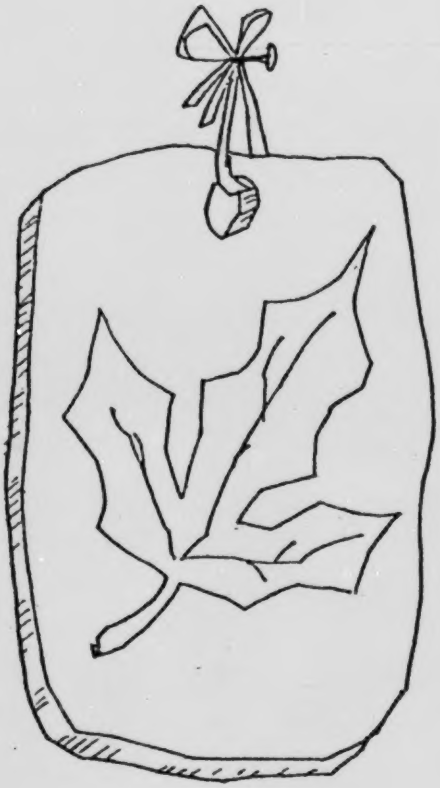
- Large leaves (those that have heavy veins and texture work best)
- Water
- Sal soda (a cleaning agent available at the grocery store)
- Soft toothbrush
- Bleach
- Food coloring
- Large pot

Directions:

1. Put two quarts of water and two tablespoons of sal soda into large pot. Bring to a boil. Add leaves and cook for a half hour.
2. Let the water cool. Drain the leaves. Rinse with cold water and drain again.
3. Place the leaf on a work surface and with a soft toothbrush, gently brush away the leaf parts, leaving only the stalks and veins.
4. Bleach the leaf skeleton by placing it in a solution of two tablespoons of bleach to one quart of water. Leave leaves in solution for about an hour.
5. The leaves can now be tinted any color desired by placing them in water which has had food coloring added. When the leaves are the desired color, remove them and blot with paper towels. Let the leaf skeletons dry thoroughly.



LEAF PRINT TILES



Materials:

- Ceramic clay
- Assortment of leaves
- Rolling pin or dowel
- Knife
- Two strips of wood, about ½ in. thick
- Newspaper or oil cloth

Directions:

1. Roll clay flat between two strips of wood.
2. Arrange leaf or leaves on clay slab, vein sides down.
3. Run the rolling pin over the leaves to press them into the clay.
4. Use knife to cut out tiles (or free form shapes).
5. Allow to dry for about a week. There is no need to remove leaves as they will dry and curl up. Pieces that may remain will burn away during firing.
6. When thoroughly dry, fire in kiln.
7. Glaze, if desired, and refire.

These tiles make good hot plates, spoon holders and can also be combined to make effective murals. You can even make a hole, while clay is wet, and hang them on the wall.

(Baker's dough can also be used to make these tiles. Recipe: 1 cup salt, 2 cups flour, 1/2 cup water, 2 tbsp. oil. Follow steps 1 through 4 above, then, bake in a slow 250 degree oven for several hours. The thicker the dough, the longer it will take to dry. After leaf has dried, it can be painted or coated with clear shellac.)

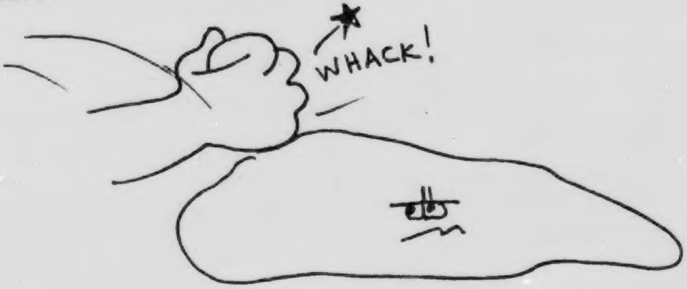
CERAMIC LEAVES

Materials needed:

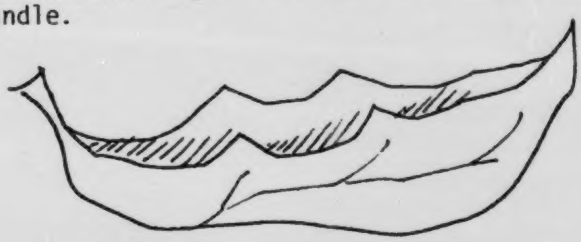
- Ceramic clay
- Large leaves, sycamore, maple or fruitless mulberry
- Two strips of wood about ¼ in. thick
- Rolling pin or dowel
- newspaper or oil cloth
- knife

Directions:

1. Pound clay to remove air bubbles.
2. Roll clay flat between two strips of wood. Make a slab large enough to fit leaf.



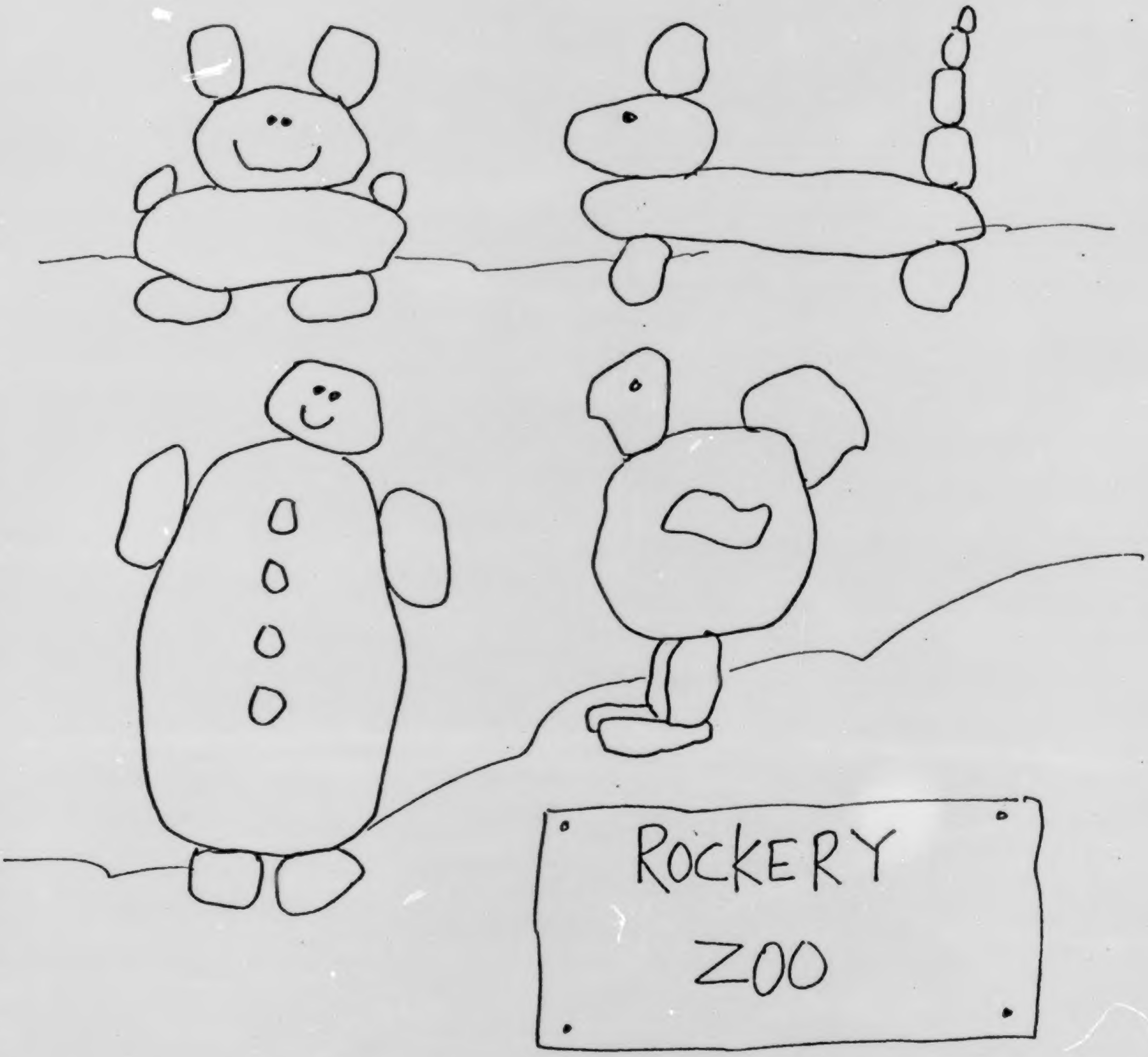
3. Remove stem from leaf. Place leaf, vein side down, on clay and roll with rolling pin or dowel to press into clay slab.
4. Use knife to cut outline of leaf. Leave about a 1½ inch strip to make stem.
5. Carefully remove leaf and bend edges of clay to resemble real leaf. Roll up stem to make a handle.



6. Let dry thoroughly. Fire in kiln.
7. Glaze, if desired. Fire again.

Rock Animals

Gather small stones and pebbles of different shapes and sizes. Scrub them with soap and water and let them dry. Use the stones as different parts (bodies, eyes, ears, beaks, legs, heads, wings, tails, and so on) or the animal you want to make. Use white glue or contact cement to put the parts together. You can even give them color with some poster paint.



PINE CONE CRAFTS

Here are just a few of the many things you can make from different kinds of cones.

FIREPLACE CONES

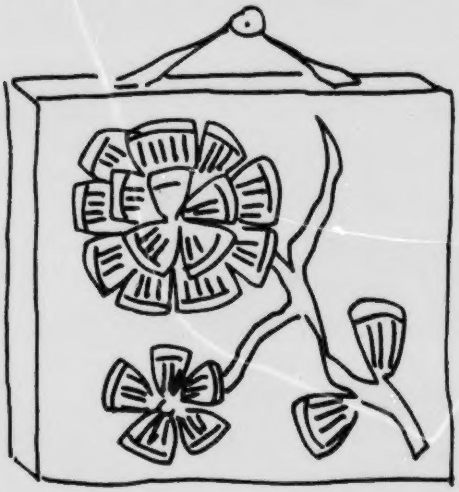
Materials:

Cones
White glue
Table salt

Directions:

1. Paint each dry cone with the glue.
2. While glue is wet, sprinkle with table salt.

Add a few of these cones to your next fire. They will burn a beautiful golden color and add a fragrant smell to the room.



PETAL PLAQUES

Materials:

Cones
White glue
Piece of wood for backing
Twigs and other natural materials.

Directions:

1. Pull the 'petals' off the cone.
2. Use the petals and other natural materials to make a picture.
3. Glue the picture to the wood. Use shellac for a shiny finish.

PINE CONE ANIMALS

You can make many different animals using the pine cone for the base. Owls and turkeys are very popular with children.

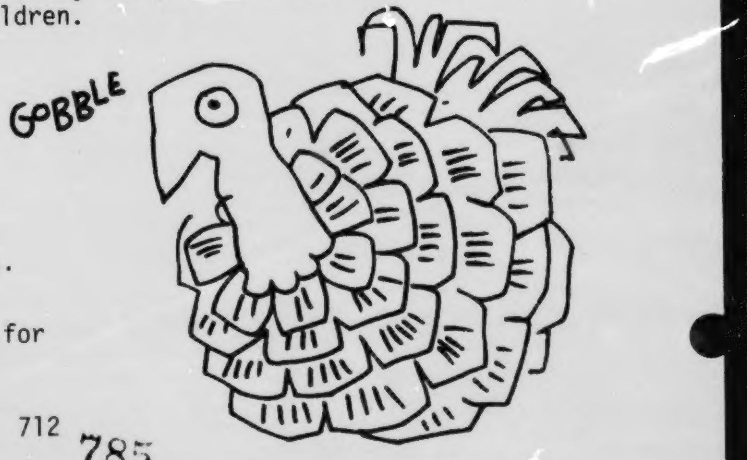
Materials:

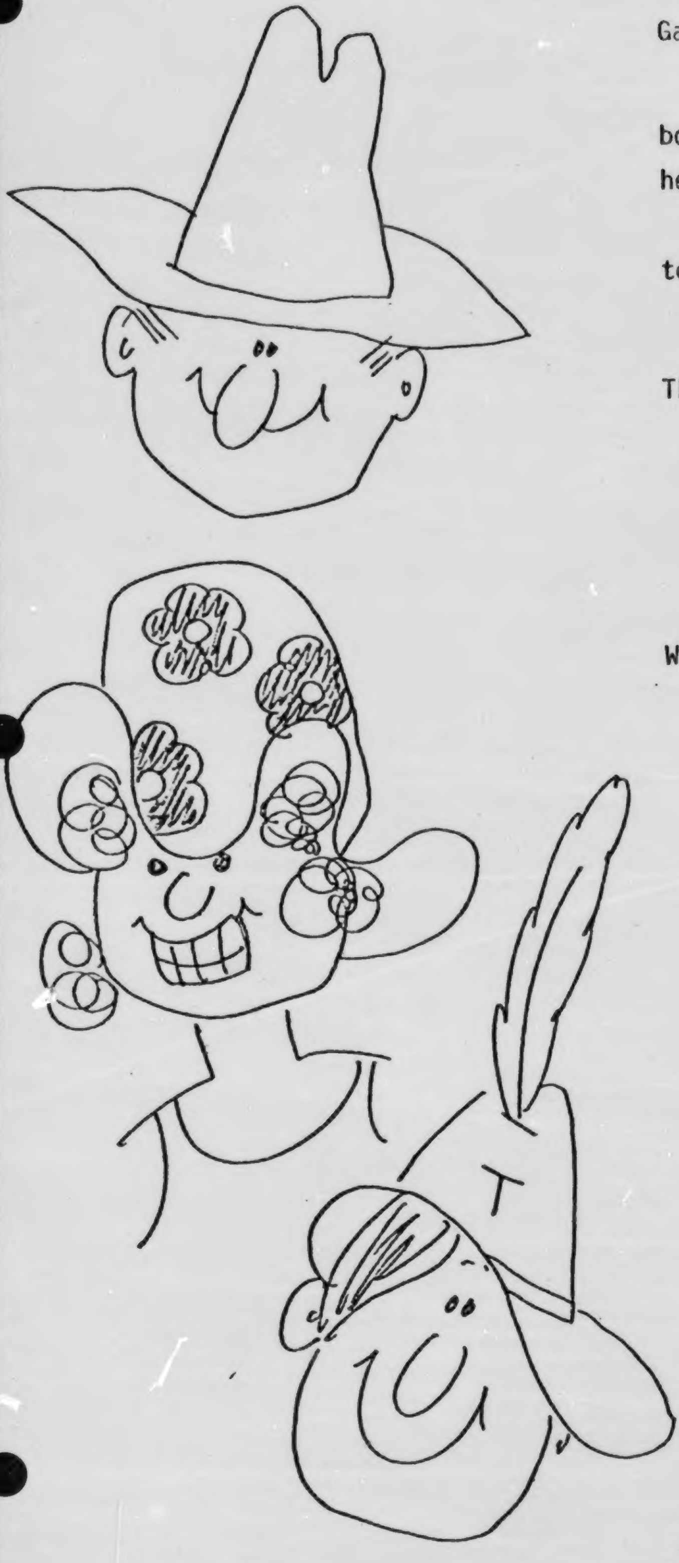
Cones
Pipe cleaners, felt, feathers, buttons, colored paper.

Directions:

For the turkey - Add paper feathers. Use pipe cleaner for the head.

For the owl - Use buttons or paper for eyes. Add a beak.





Garden Hats

You can make a cowboy hat, beach bonnet or a hat to keep the sun off your head when you're working in your garden.

It's a fun way to recycle newspapers, too.

Things you will need:

Old newspapers
Liquid starch
A bowl, big enough to fit on your head
Poster paint
Brush
Scissors

What to do:

1. Cut at least six large circles from open sheets of newspaper.

2. Lay one sheet at a time over the bowl and paint it with the liquid starch. The starch will hold the layers together and make the hat stiff.

3. After adding all the paper layers, shape the brim while the starch is still wet.

4. Let dry.

5. When the hat is completely dry, use your scissors to trim the edges. Paint the outside with poster paint. You can even decorate it with flowers, ribbons, or whatever you like.

GARDEN MARKERS

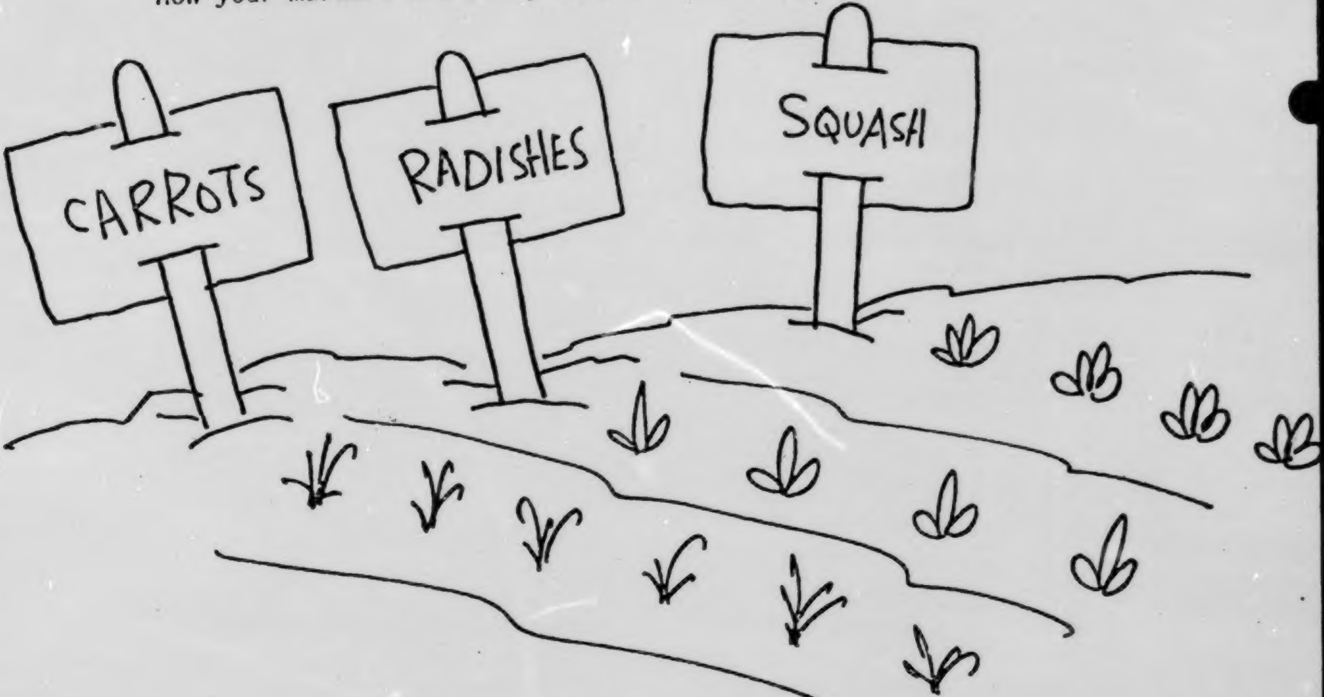
You can recycle plastic meat trays into garden markers that will not fade away at the first rain or watering.

Materials needed:

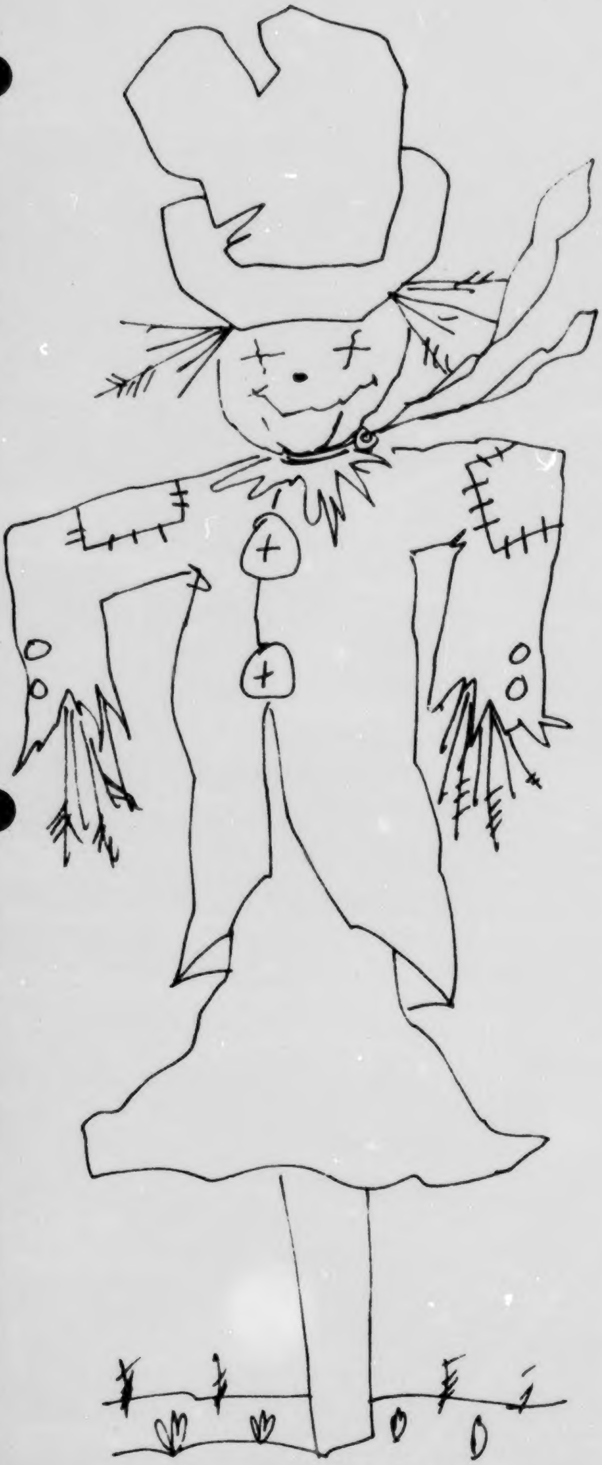
plastic-foam meat trays, waterproof markers, popsicle sticks

Directions:

Cut the plastic-foam meat trays into rectangles about 2 inches by 4 inches. Use a waterproof marker to write the name of each vegetable and flower you want to mark. You can draw pictures of the plants, too. Cut a small slit near the top center and bottom center of each rectangle. Slide a popsicle stick through the slits. Now your markers are ready to place in your garden.



787



SCARECROWS

A garden just isn't complete without a scarecrow to watch over it.

Early American farmers built scarecrows to discourage birds from eating their seeds and young plants. It is said that a wise farmer would plant four seeds in each hole--one to grow, one for the worms, and two for the birds. The most troublesome bird to the farmer was the crow who was clever enough to scratch out buried seeds and pull up the seedlings.

Unfortunately for the farmers, birds are not so dumb and although they may be scared for a few days, they will soon pay little attention to the scarecrow.

To build a scarecrow:

1. Start with a cross made from two sticks. Fallen branches, old broom sticks, or pieces of lumber will do fine to make the frame.
2. Collect old clothes to dress your scarecrow. Bright colors and things that will move with the wind are the most effective. Think about flapping ties or streamers, old jewelry that will shine, and straw hats. Large safety pins or diaper pins work well to hold the clothes together. You can also use suspenders to hold the pants up.
3. Stuff the scarecrow with hay, dried grass clippings or fallen leaves. Newspaper will work but it will get soggy after the first rain.
4. Make a head from an empty plastic jug, plastic bag, aluminum pie pan or even an old Halloween mask.
5. Give your scarecrow a name.

(You may even want to enter your scarecrow in a contest. The Nut Tree Restaurant, Vacaville, California has begun an annual scarecrow contest which is held in October. "Howard Crowsell" and "Bob Crowpe" were entries last year.)

Bird Feeders

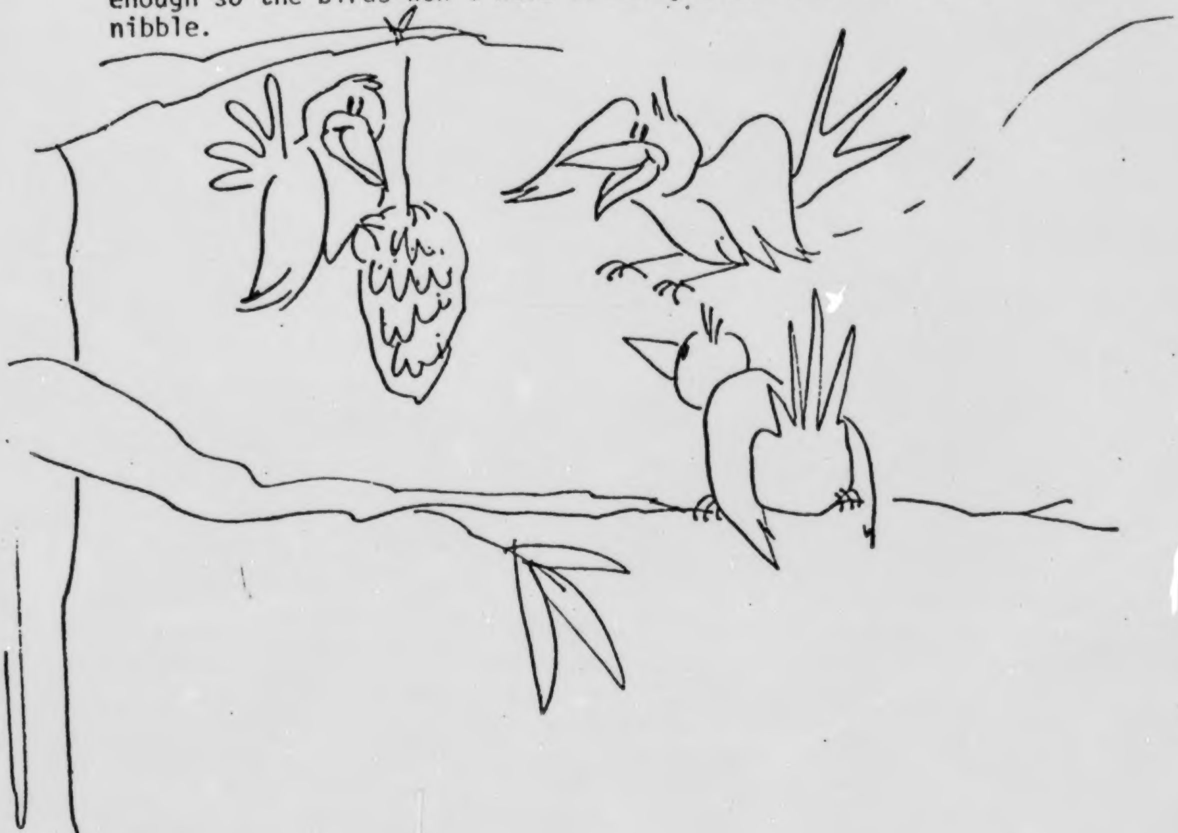
A special treat for backyard friends.

Things you will need:

Pine cones
Peanut butter
Bird Seed
String

What to do:

1. Rub the peanut butter on the pine cone.
2. Roll the covered pine cone in the bird seed.
3. Tie the string to the covered cone and hang from a tree. Hang it high enough so the birds won't have to worry about cats or dogs while they nibble.



More Bird Feeders

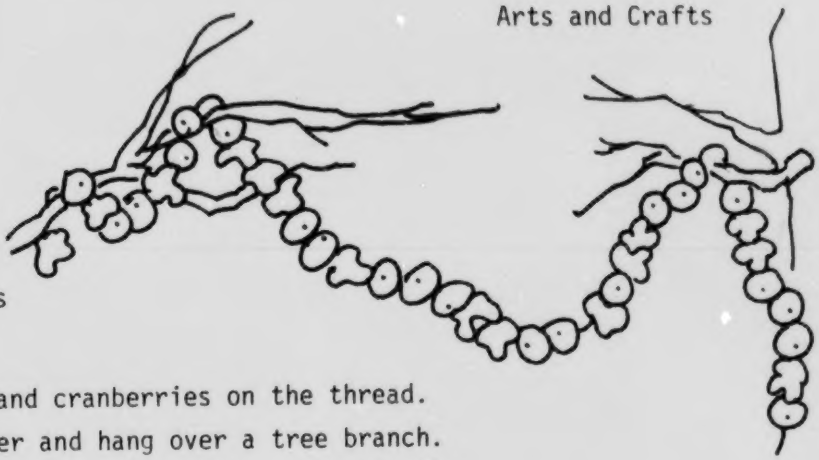
GARLANDS

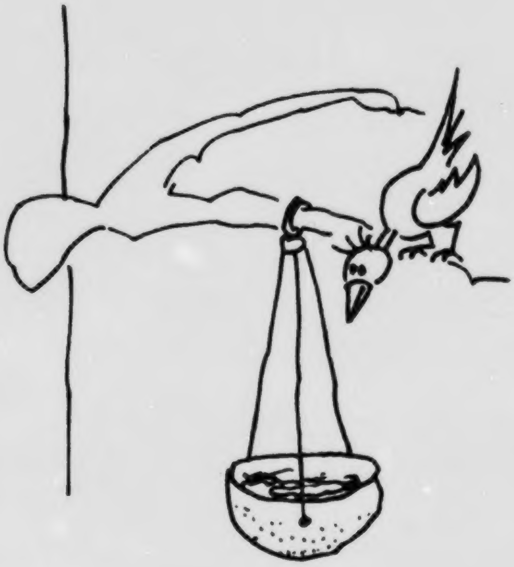
Things you will need:

Strong needle
Carpet thread
Popcorn, cranberries

What to do:

1. String the popcorn and cranberries on the thread.
2. Tie the ends together and hang over a tree branch.





FRUITY BASKETS - For Suet-Eating Birds

Things you will need:

Grapefruit half
Leftover grease from bacon and other meats, any type of suet
Cord

What to do:

1. After eating the grapefruit half, scrape out all the pulp.
2. Poke three holes an equal distance apart near the top of the rind.
3. Fill the 'basket' with the leftover grease.
4. Pull strong string or cord through the holes and hang from a tree branch.

(You can leave off the cord and wedge the basket between two tree branches.)

If you begin to put feeders out for the birds, be sure to keep feeding them. They will rely on your food supply.

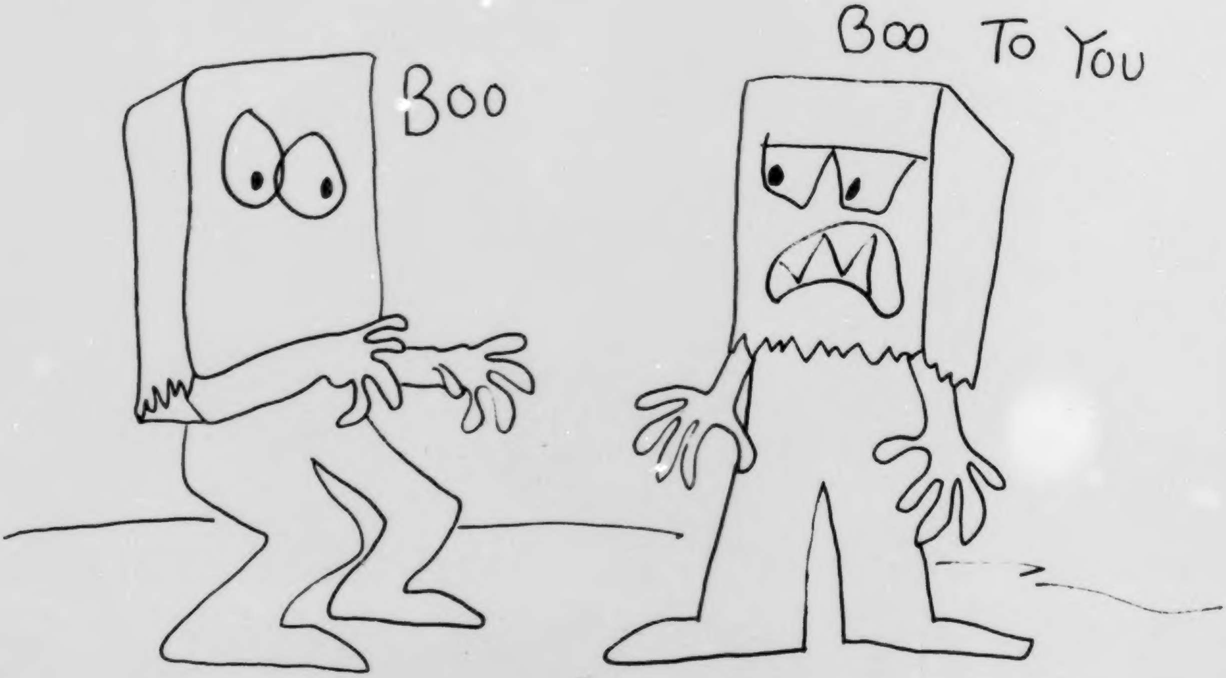
Paper Shopping Bags

A long time ago there weren't any shopping bags. People brought their own reusable containers with them to the stores to carry home their purchases. Then, in 1906, the first paper shopping bags were made. Now paper bags are used by all the stores. Three big paper companies make hundreds of millions of paper bags every year.

There are lots of ways to recycle paper bags You can use them again. Some stores will pay you for every bag you return to use again. Other ways to recycle paper bags include covering books, making a litter bag, and making a mask. You can probably think of lots of others things to do with paper bags.

Here's how to make a mask.

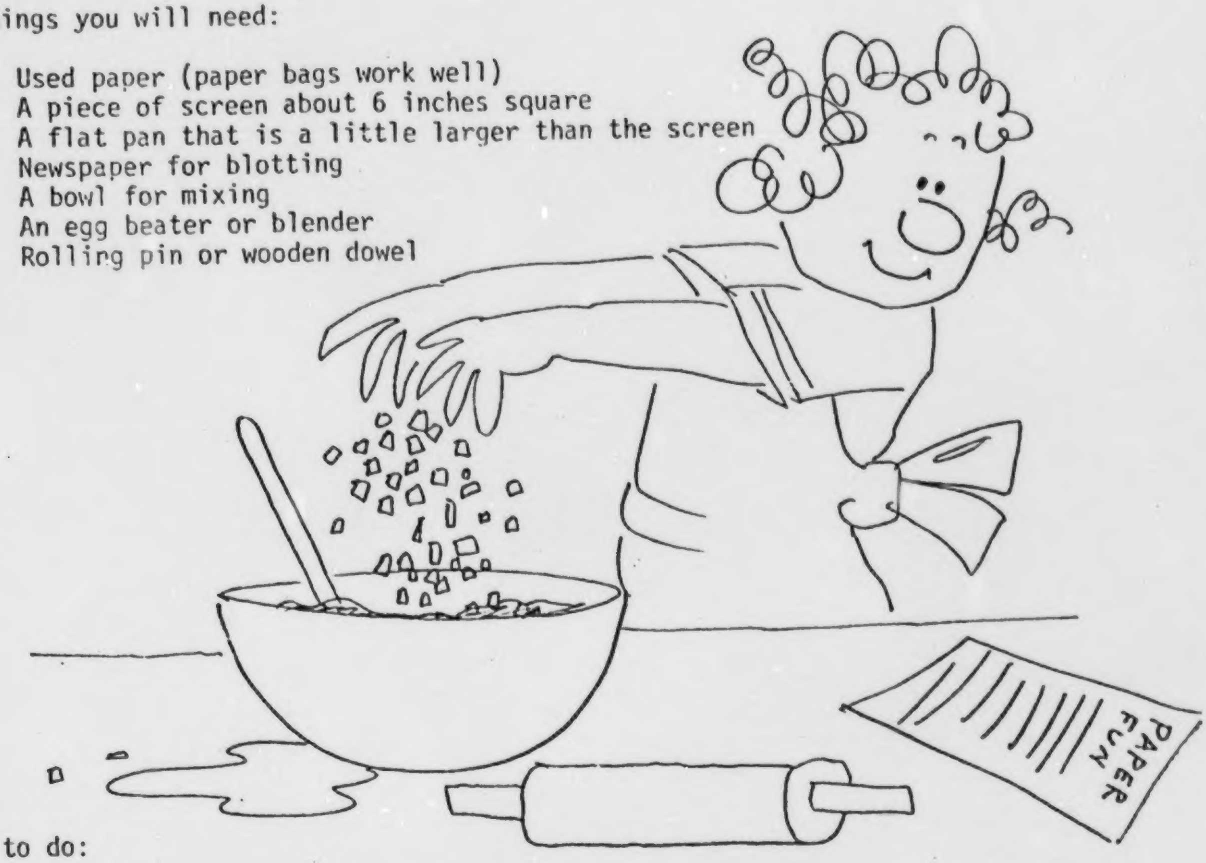
1. Find a used bag big enough to comfortably go over your head.
2. Cut out the spaces where your eyes will be able to see.
3. Add hair, eyelashes, a nose, a mouth, ears, and whatever else you'd like.



aking Recycled Paper

Things you will need:

Used paper (paper bags work well)
A piece of screen about 6 inches square
A flat pan that is a little larger than the screen
Newspaper for blotting
A bowl for mixing
An egg beater or blender
Rolling pin or wooden dowel



What to do:

1. Tear the used paper into little tiny pieces. Add about two cups of hot water. Beat the paper and water with the beater or blender to make pulp.

2. Pour the pulp into the flat pan. Slide the screen into the bottom of the pan and move it around until it is evenly covered with pulp. Lift the screen out carefully. Hold it level and let it drain for a minute.

3. Put the screen, pulp side up, on the newspaper. Put more newspaper on top and use the rolling pin to squeeze out more water.

4. Carefully remove the top newspaper. Move the screen with the pulp to some dry newspaper to let dry. When the paper is almost dry, you can peel it off the screen. Let it dry thoroughly. You now have a piece of recycled paper. Use it for stationery, a picture, or a beautiful background for a leaf print.

A PAPER TREE THAT GROWS

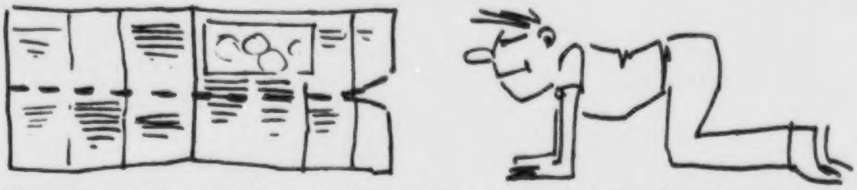
Here's an idea from "The Everything Book" by Eleanor Graham Vance. It has lots of things for children to make and do.

Materials needed:

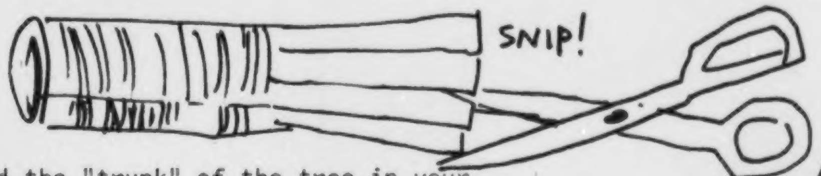
- Double sheet of newspaper
- Scissors

How to do it:

1. Take a double sheet of newspaper and tear it in half across the middle.

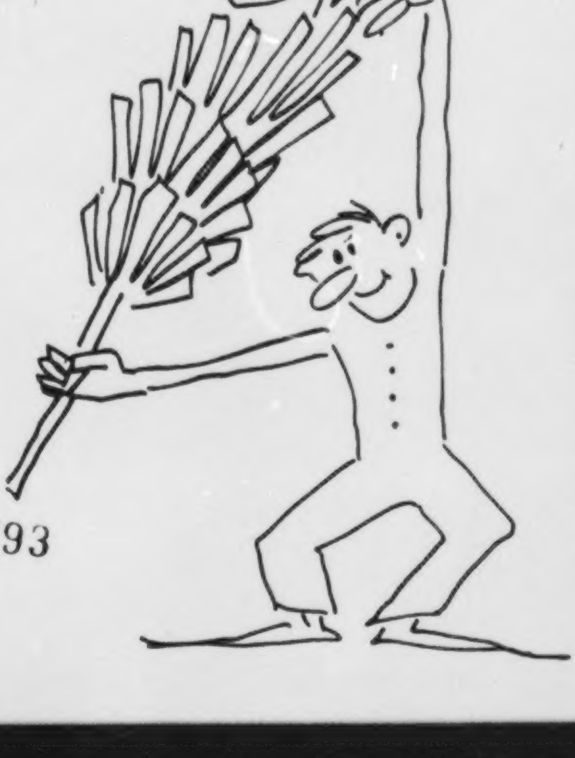


2. Roll one half up into a tube. When you get about five inches from the end, add the other half sheet and roll it into the same tube.
3. Flatten the tube. Cut down from the top about four inches. Make four cuts.



4. Hold the "trunk" of the tree in your left hand. Reach into the center "leaves" and pull them gently upward so that the tree grows.

You can make even higher trees by rolling another sheet of newspaper in the same way.



EGG CARTON JEWELRY

Things you will need:

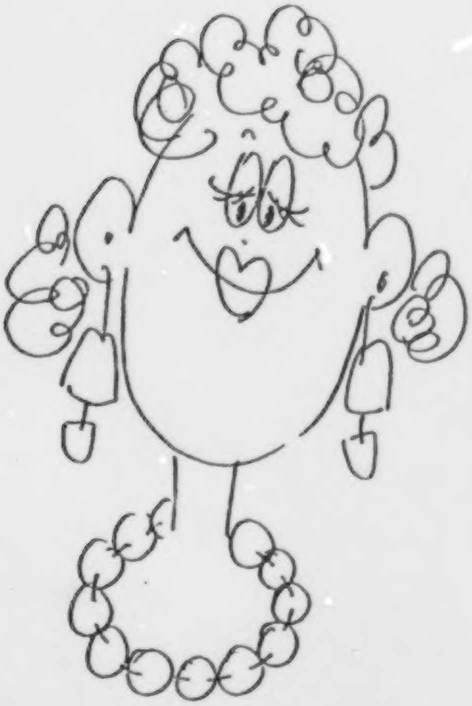
Plastic egg carton lids
Aluminum foil
Cookie cutter or scissors
Paper hole punch
Colored felt pens

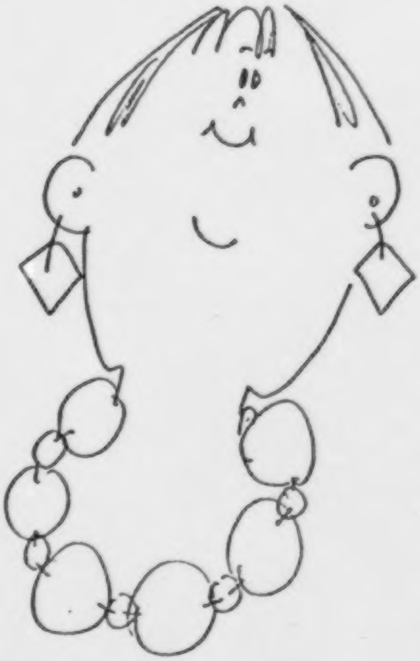
What to do:

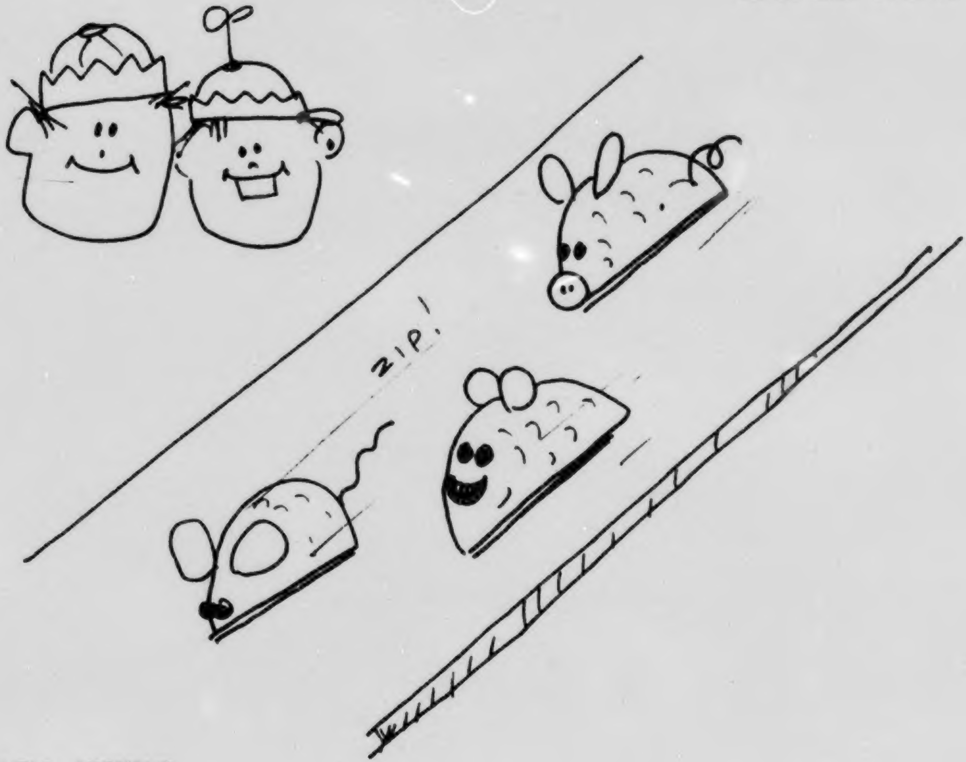
1. Press cookie cutter firmly through egg carton lid to make ornaments.
2. Color with felt pens.
3. Punch a hole in the ornament with paper hole punch.
4. Place shapes on a cookie sheet lined with aluminum foil.

   Preheat oven to 375° and bake for about one minute. (To get a hard plastic firmness, shrink, wait, and then shrink again.)

   Egg carton shapes shrink about 3/4 of their original size.







WALNUT SHELL ANIMALS

Materials needed:

- Walnut shell half for each animal
- Scraps of felt or paper for tails, heads, feet, etc.
- White glue
- Marble

How To Do It:

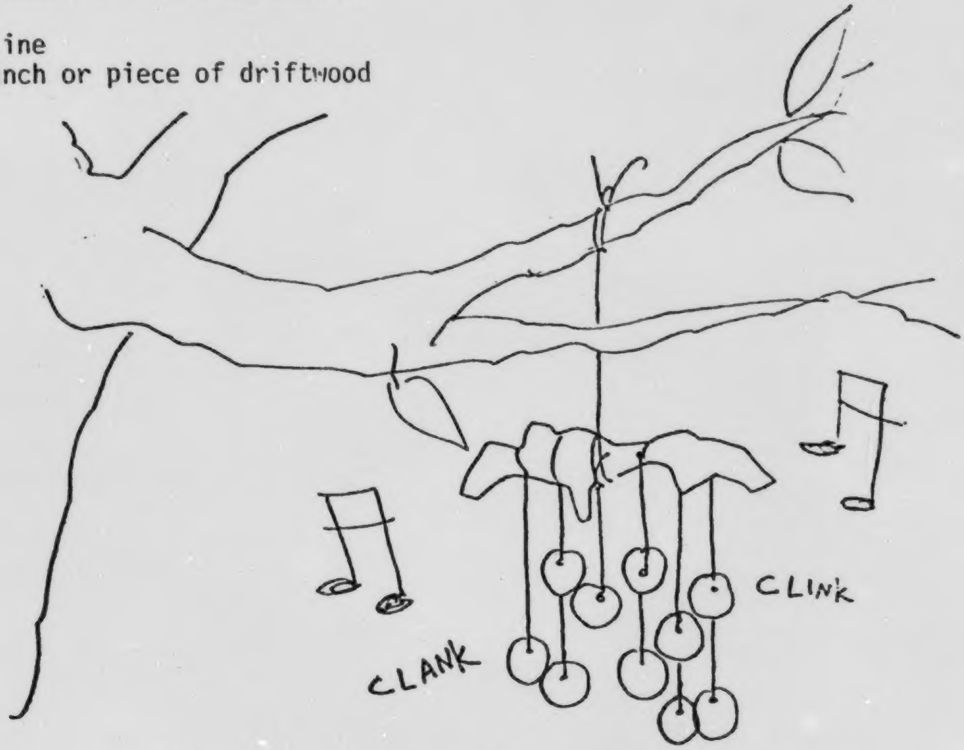
1. Cut heads, tails, or whatever from felt or paper scraps.
2. Glue to bottom edge of walnut half.
3. When glue dries, place marble under shell and let animals race down a sloping board.

Wind Chimes

The energy of the wind can even make beautiful music for you.

Things you will need:

- Ceramic clay (red or white)
- Rolling pin or wooden dowel
- Cookie cutters of different shapes
- String
- Fishing line
- Small branch or piece of driftwood



1. Use the rolling pin or dowel to roll the clay to about 1/4 inch thickness. (The back of oilcloth or newspaper makes a good rolling surface.)
2. Cut out desired shapes with cookie cutters. Three or four pieces makes a nice wind chime. Make a hole about 1/2 inch from the edge of each piece.
3. Let all pieces air dry. Fire in kiln.
4. Thread each piece with fishing line and attach to branch or driftwood. Hang pieces at different levels but allow them to touch or there will be no music.
5. Tie string to branch and hang in a breezy place.

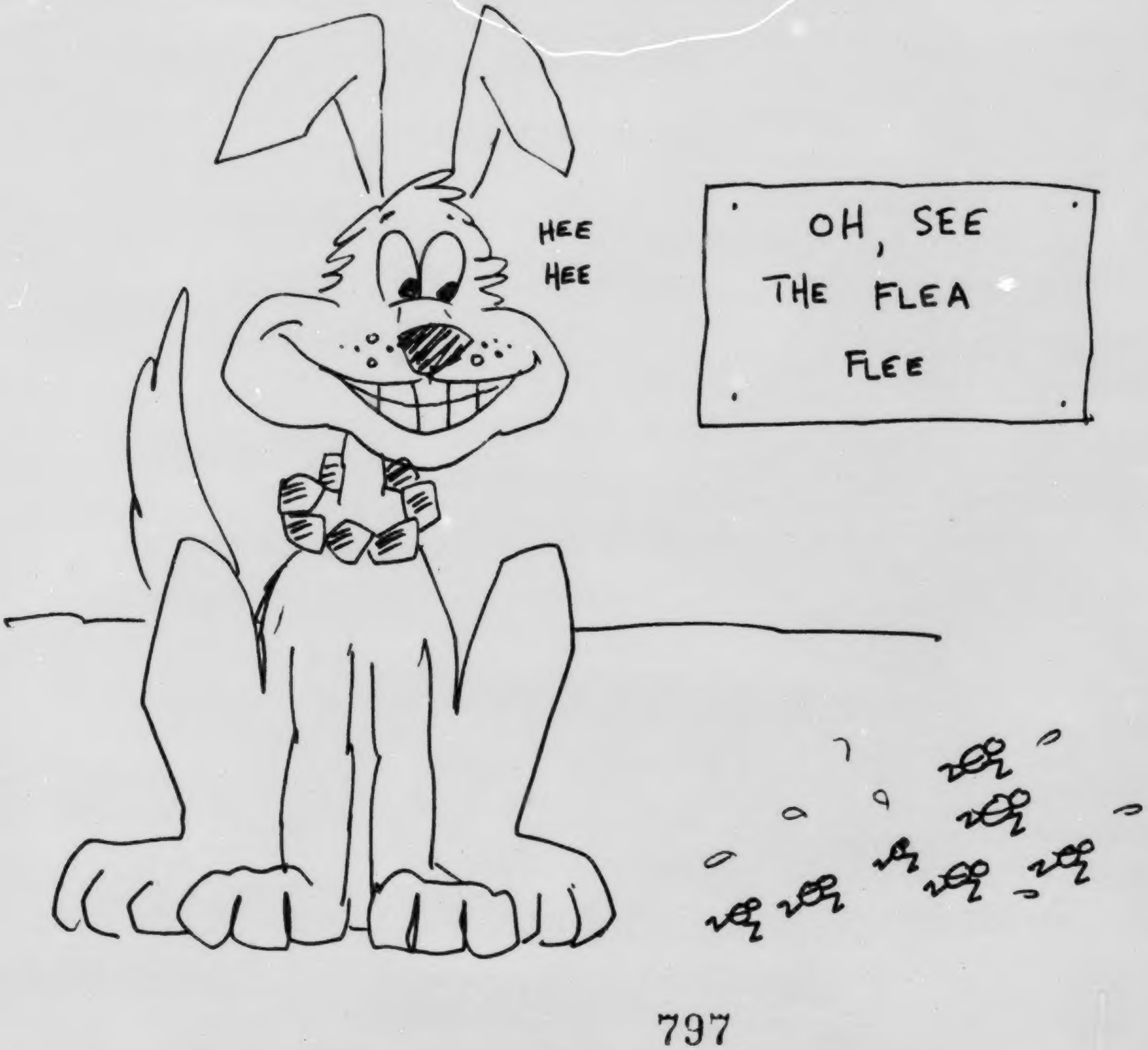
NATURAL FLEA COLLARS

Materials:

Eucalyptus pods
Sturdy needle
Dental floss

Directions:

Poke a needle threaded with dental floss through the soft centers of the eucalyptus pods. String enough to fit around your dog's neck. Tie the ends. The eucalyptus smells good to us but fleas hate it.

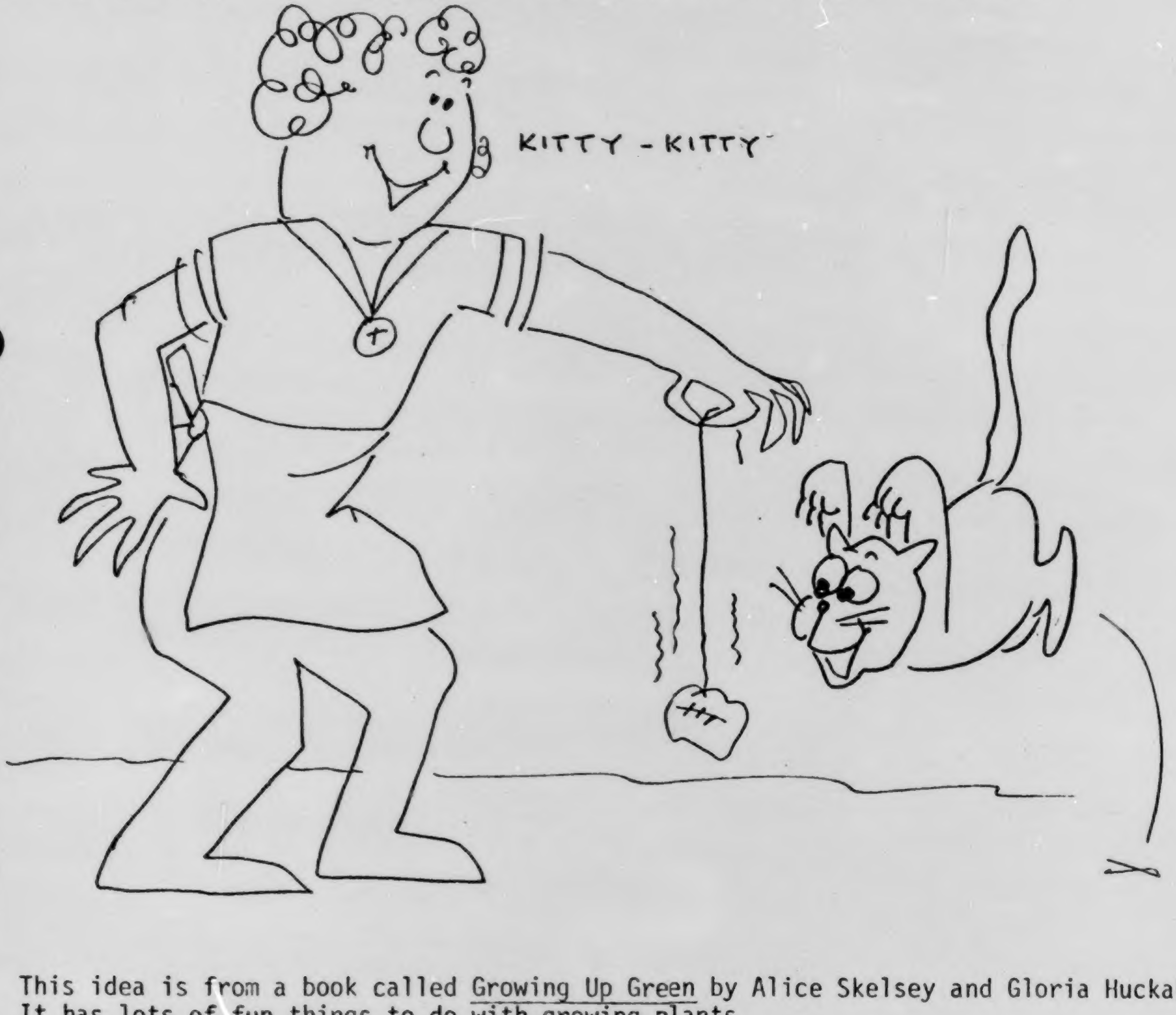


Kitty Toy

With a little growing and a little sewing you can make a fun toy for your favorite cat.

Catnip is a herb that grows easily from seed. Follow the directions on a seed package to grow some catnip. When the plant is 1½ to 2 feet high, break off several pieces and hang them upside down in a cool, airy place to dry. When the leaves are dry, strip them from the branch and gently crush them. This is the stuffing you your kitty's toy.

Choose a strong piece of scrap material (old jeans are good) and cut two pieces in the shape you want. Sew the two pieces together with tiny strong stitches on three sides. Stuff the toy with the catnip and sew the fourth side.



This idea is from a book called Growing Up Green by Alice Skelsey and Gloria Huckaby. It has lots of fun things to do with growing plants.

Potpourri or Fragrance Jars

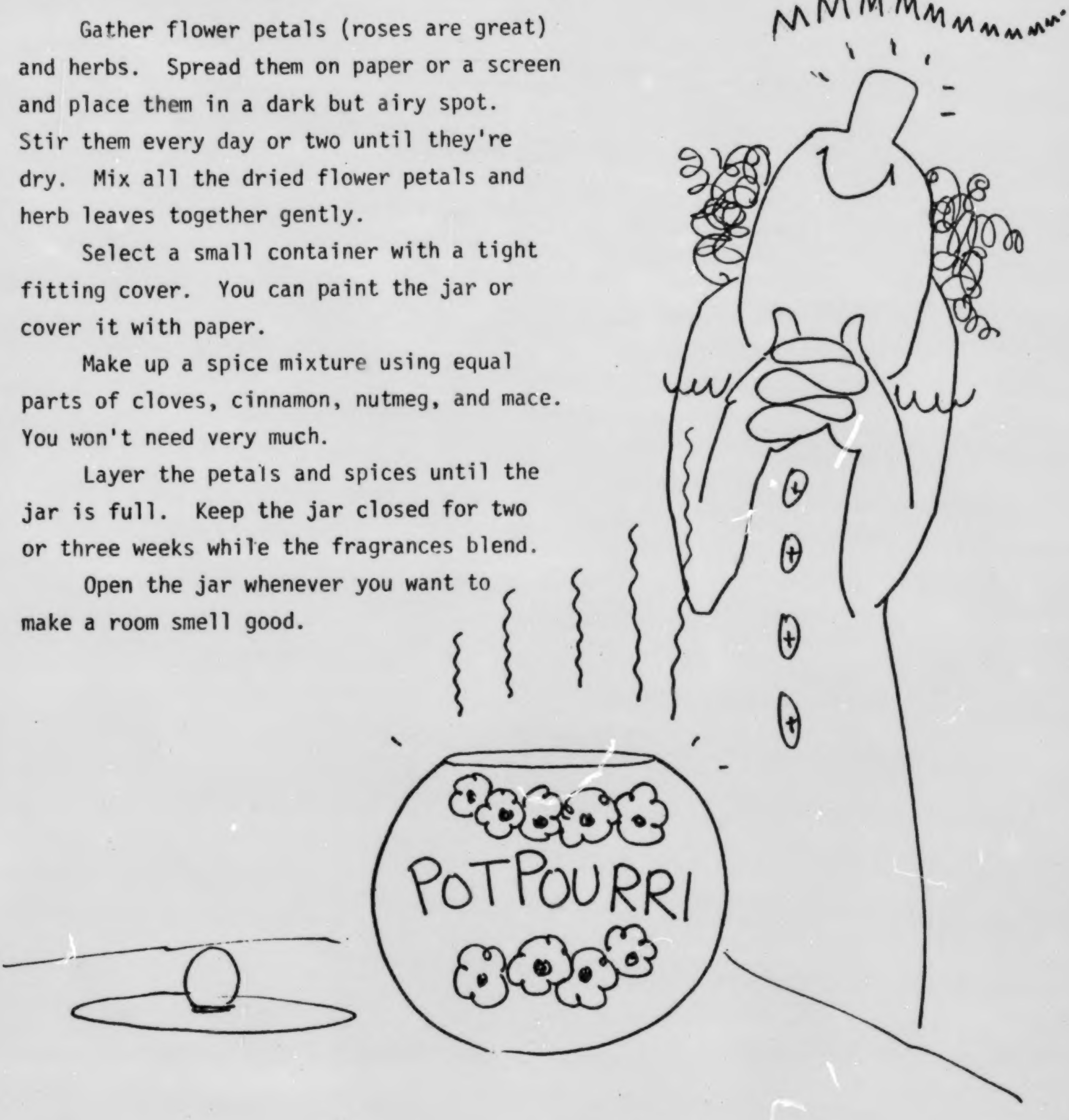
Gather flower petals (roses are great) and herbs. Spread them on paper or a screen and place them in a dark but airy spot. Stir them every day or two until they're dry. Mix all the dried flower petals and herb leaves together gently.

Select a small container with a tight fitting cover. You can paint the jar or cover it with paper.

Make up a spice mixture using equal parts of cloves, cinnamon, nutmeg, and mace. You won't need very much.

Layer the petals and spices until the jar is full. Keep the jar closed for two or three weeks while the fragrances blend.

Open the jar whenever you want to make a room smell good.



MONSTER MARKERS

A creative way to recycle empty deodorant bottles.

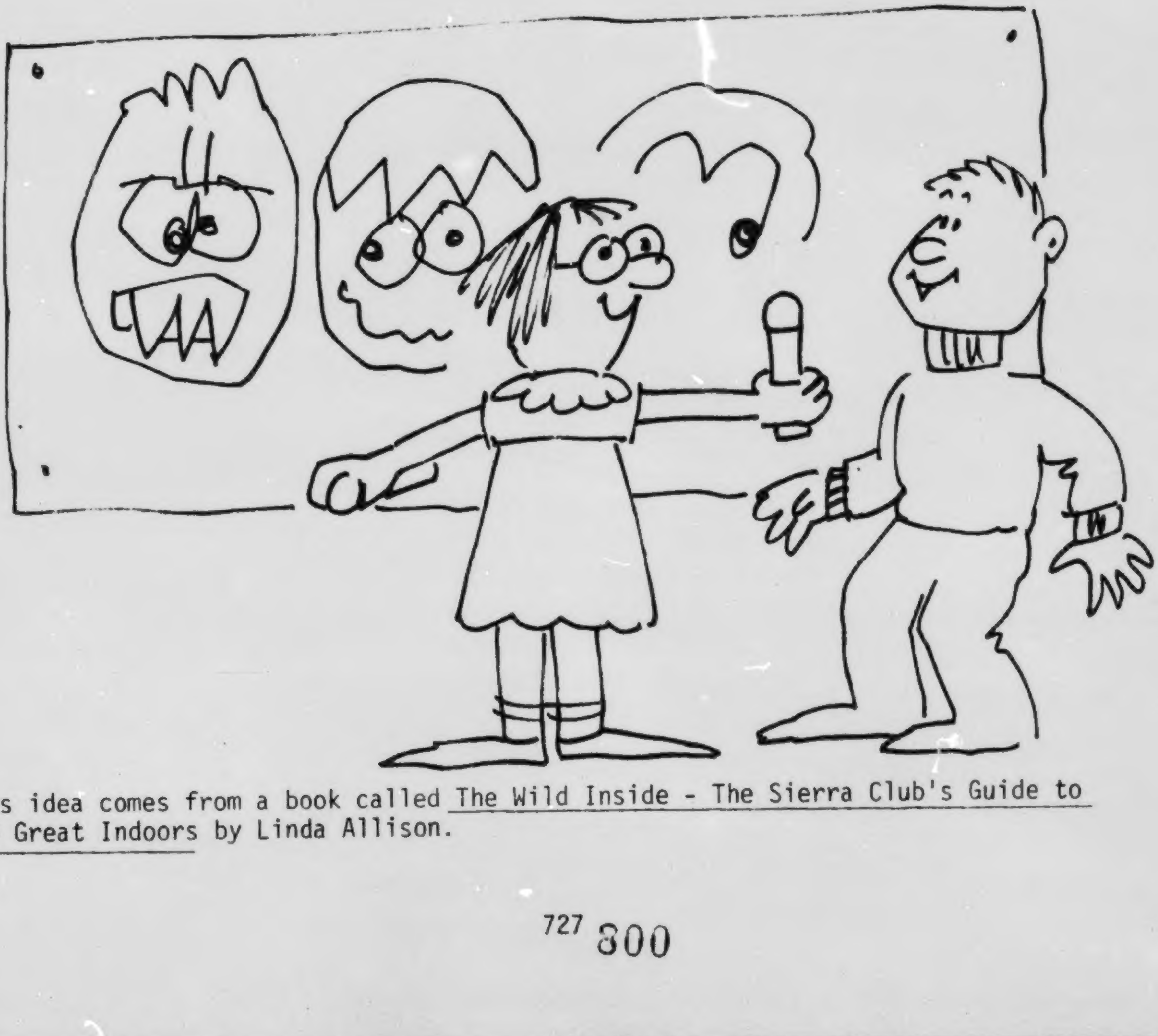
Materials:

Empty roll-on deodorant bottles
Poster paint

What to do:

1. Take the deodorant bottles apart. Wash well.
2. Mix up some poster paint. Get out all the lumps. It should be as thick as cream.
3. Pour the paint into the bottle.
4. Put the roll-on cap back on. Draw away.

Be sure to put the outer cap back on when you are finished.



This idea comes from a book called The Wild Inside - The Sierra Club's Guide to the Great Indoors by Linda Allison.

GOURD BIRDS

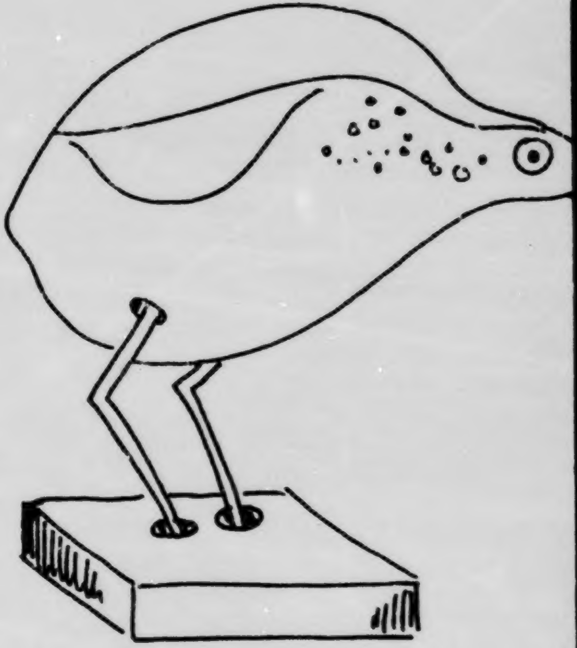
Beautiful birds can be made from gourds. Choose natural colored gourds for colored birds or paint with acrylic paints. Add eyes and legs and admire!

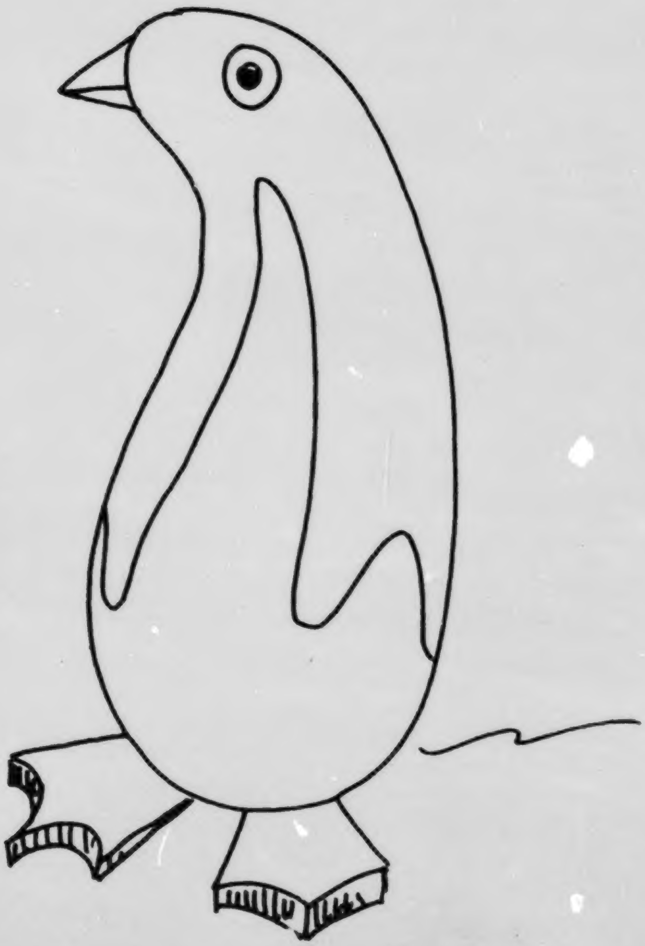
Materials needed:

Gourds, colored felt pens or paints, clear varnish, household cement.

For penquin-type standing: scissors, stiff cardboard.

For sandpiper-type: small scrap of wood, drill, coat hanger, wire cutters.





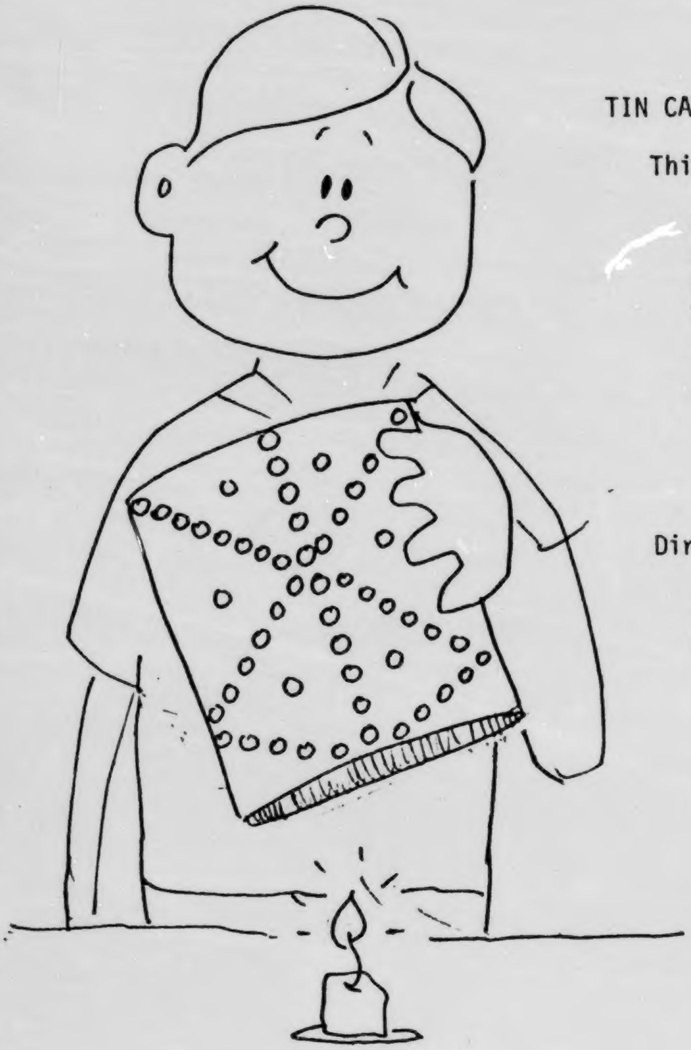
DIRECTIONS

Choose a gourd shaped like a bird. Paint with acrylic paint or simply draw wing lines and eyes.

To balance the penquin, cut out cardboard feet and glue on.

To stand up birds, like the sandpiper, drill two small holes in the gourd and two more in a small wooden base. Cut two equal length pieces of coat hanger wire and glue into the holes in the gourd and the wood.

Paint your gourd birds with clear varnish and let dry.



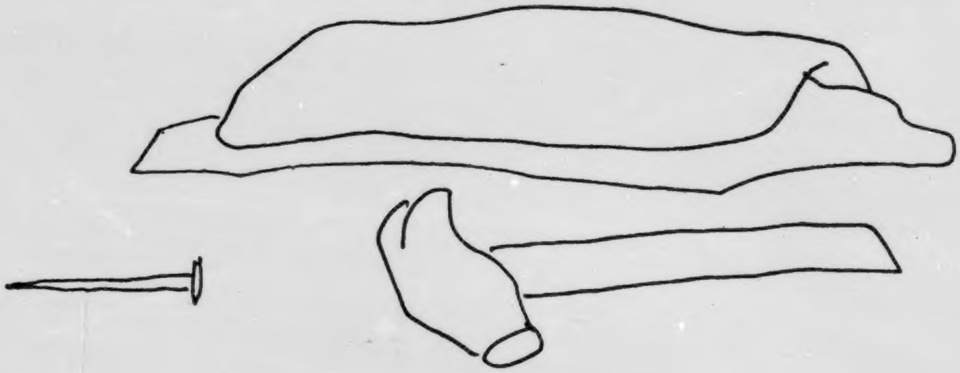
TIN CAN LANTERNS

Things you will need:

Large can with one end removed
Nail
Hammer
Water
Small candle (votive candle in a
glass jar works well)
Towel
Crayon or felt pen to mark pattern

Directions:

1. Draw design all around can.
2. Fill the can to 1/4 inch from the top with water. Place the can in a freezer for two days so the ice can get hard.
3. Place the can filled with ice on a towel (to soak up drips as ice melts). Hammer evenly spaced holes through the lines of the pattern.
4. Allow ice to melt. Place can over candle to make pattern glow.



CRYSTAL GARDENS

Materials needed:

Several chunks of porous materials, such as tanbark, driftwood, cork, pieces of sponge or brick.

Aluminum pie plate

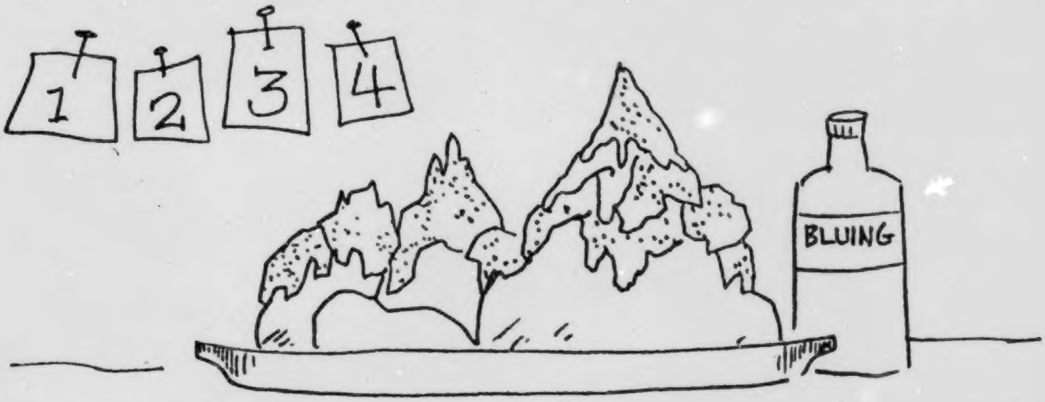
Solution

4 tablespoons noniodized table salt
4 tablespoons liquid bluing
4 tablespoons water
1 tablespoon ammonia

Food coloring, one or two drops

How To Do It:

1. Arrange porous materials in aluminum pie plate.
2. Spoon solution over the materials. Make sure that the solution covers the bottom of the container.
3. Drop a little food coloring over the 'garden'.
4. Set the pie plate where you won't have to move it for the next four days.



As the liquid travels to the surface, the water in it evaporates, leaving a saturated salt solution. Salts crystallize from this and keep growing until the solution dries out.

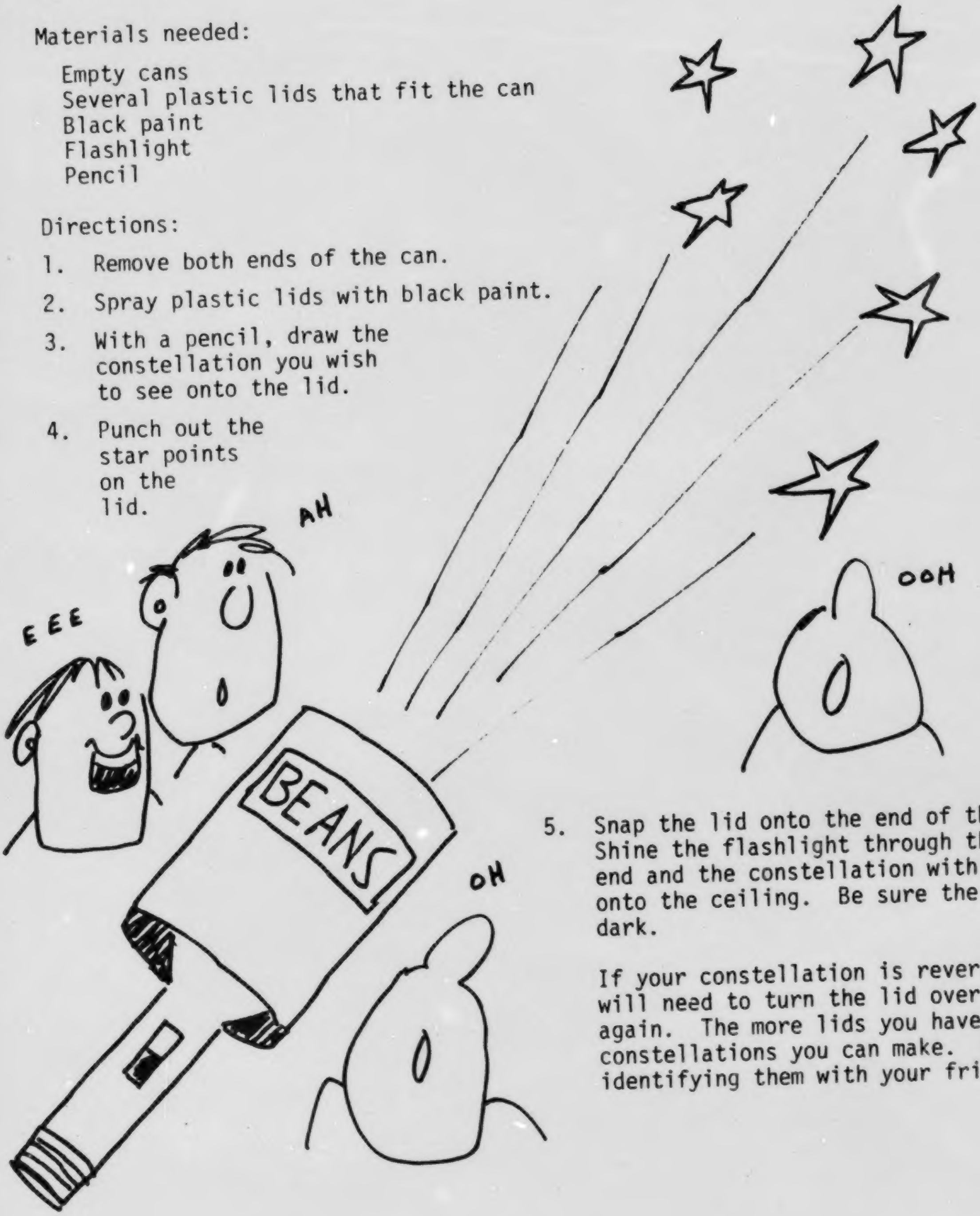
PLANETARIUMS

Materials needed:

Empty cans
Several plastic lids that fit the can
Black paint
Flashlight
Pencil

Directions:

1. Remove both ends of the can.
2. Spray plastic lids with black paint.
3. With a pencil, draw the constellation you wish to see onto the lid.
4. Punch out the star points on the lid.



5. Snap the lid onto the end of the can. Shine the flashlight through the other end and the constellation with project onto the ceiling. Be sure the room is dark.

If your constellation is reversed, you will need to turn the lid over and try again. The more lids you have, the more constellations you can make. Practice identifying them with your friends.

SNOW SCENE JARS

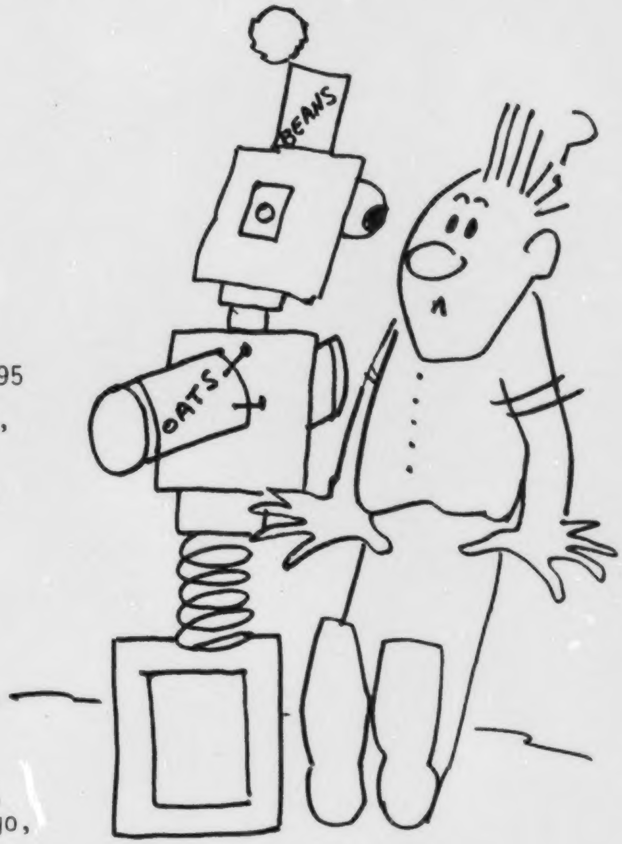
Materials needed:

Baby food jar with lid
Silver glitter
Glycerine
Small objects to make scene (twigs for trees, pebbles, plastic toys)
White glue
Water

Directions:

1. Make a stand-up scene on inside of lid. Glue objects securely in place. Let dry.
2. Fill bottle carefully with glycerine until 3/4 full. Fill the rest with water.
3. Add about one teaspoon of glitter.
4. Screw top on tightly. Invert and watch the 'snow' fall. Shake the jar gently to see a full snow storm.

(Another way is to use water and 2 tablespoons of moth flakes. You may want to coat the jar lid with water proof cement and screw it on tight.)



TEACHER REFERENCE BOOKS

ARTS AND CRAFTS

1. ADVENTURES WITH A CARDBOARD TUBE, Harry Milgrom, Dutton Pub., New York, 1972, $6.50
2. ART FROM FOUND MATERIALS - Discarded and Natural, Mary Lou Stribling, Crown Pub., New York, 1970, paper $4.95
3. ART FROM FOUND OBJECTS, Jeremy Comins, Lathrop, Lee and Shepard Co., $5.50
4. ART FROM RECYCLED MATERIALS, Dorothea C. Malcolm, Davis Pub., $9.95
5. BOTTLES AND CANS: Using them Again, A Puffin Book, McPhee Gribble Pub., Penguin Books, Australia, 1977, paper $1.50
6. CHILDREN'S CRAFTS, Sunset Books, ed., Lane Pub., Menlo Park, California, paper $2.95
7. COLLECT, PRINT AND PAINT FROM NATURE, John Hawkinson, Whitman Books, Chicago, 1963, $4.50
8. CORRUGATED CARDBOARD CRAFTING, Dick Van Voorst, Sterling Pub., New York, 1969, $3.75
9. CRAFTING WITH NATURE'S MATERIALS, Chester Jay Alkema, Sterling Pub., New York, 1972, $3.75
10. CREATIVE CRAFTS, Frederick Oughton, McKay Pub., New York, 1976, $4.95
11. CREATING FROM SCRAP, Lillian and Godfrey Frankel, Young Readers Press, New York, $ .75
12. CREATING WITH STYROFOAM AND RELATED MATERIALS, Tom Harris and Elsie Harley, J.G. Ferguson Pub., $4.95
13. FOXTAILS, FERNS AND FISH SCALES, Ada Graham, Four Winds Press, $8.95
14. JUNIOR CRAFT BOOK, Johanna Bradley, ed., Saturday Evening Post Co., Indiana, paper $1.25
15. JUST A BOX?, Goldie Taub Chernoff, Scholastic Book Services, New York, paper $ .75
16. KITCHEN CARTON CRAFTS, Helen Roney Sattler, Lathrop, Lee and Shepard Co., paper $4.95
17. NATURAL DYES AND HOME DYEING, Rila J. Adrosko, Dover Pub., New York, 1971, paper $2.00
18. NATURE CRAFTS, John R. Saunders, Golden Press, New York, $4.95

ARTS AND CRAFTS

19. NATURE CRAFTS AND PROJECTS, Beverly Frazier, Troubador Press, California, 1972, paper $1.50

20. ONE HUNDRED TWO BIRD HOUSES AND FEEDERS YOU CAN MAKE, Hi Sibley, South Holland: Goodheart-Willcox, $4.00

21. OUTDOOR ART FOR KIDS, Charleen Kinser, Follett Pub., Chicago, 1975, $5.95

22. PAPERCRAFT, Carson Ritchie, McKay Pub., New York, 1976, $4.95

23. PEBBLES AND PODS: A Book of Nature Crafts, Goldie Taub Chernoff, Walker Pub., New York, 1973, $3.50

24. SIERRA CLUB SUMMER BOOK, Linda Allison, Charles Scribner's Sons, paper $4.95

25. RECYCLOPEDIA, Robin Simons, Houghton Mifflin Pub., Boston, 1976, paper $3.95

26. SNIPS AND SNAILS AND WALNUT WHALES, Phyllis Fiarotta, Workman Pub., paper $4.95

27. TIN-CAN CRAFTING, Sylvia Howard, Sterling Pub., New York, 1959, $5.95

28. TRASH CAN TOYS AND GAMES, Leonard Todd, Viking Press, New York, 1974, $6.95

GROWING PLANTS

Growing plants in or out of the classroom is a fun and rewarding experience for children.

If you have the space, you might want to consider an outdoor school or community garden which can be shared by many classes and perhaps become a total school project.

For teachers who want to start on a smaller scale, the classroom can provide a setting for many gardening activities. Plants growing in a room add humidity to the air, create a pleasant environment, and offer many learning experiences.

In addition to the obvious science experiments of light and water requirements, growing plants can provide opportunities for measurement, charting, and graph making. Language activities might include reading and writing instructions for plant care, labeling, recording, and creative writing.

Students are rewarded with plants they can take home, use for gifts, and the knowledge of how to start and care for their own plants.

Suggestions for classroom gardeners:

Space - The most popular space for plants in the classroom seems to be a simple shelf or cabinet top located under the window area of the room. Many teachers have added 1x12 shelving supported by brackets to provide growing space for plants. But, even classrooms without windows can have gardens. Sink areas, book shelves, movable carts and tables are all usable as long as you provide adequate lighting. Hanging baskets are another alternative when space is a problem. Kindergarten sand tables make excellent gardens since they are usually movable and have drainage holes. They can even be wheeled outdoors occasionally for a 'sun' period.

Containers - Plants will grow in almost anything from fancy peat and clay pots to milk cartons and used cans. Check with your school cafeteria (if you have one) for usable containers such as glass jars for terrariums and large used cans for general planting. Plastic containers such as dishpans, buckets, and wall paper water troughs are also good and inexpensive to purchase. Aluminum pie pans make good water catchers for containers with drainage holes.

Light and Temperature - Most common plants will grow with the same light and temperature that is found in the classroom setting. But, since proper lighting is probably the most important factor in growing success, you may wish to invest in one of the many 'grow' lights available in most stores. These lights can be attached to bookcases, walls, or are available as free standing units and will enable you to set up your garden anywhere in the room. The other advantage of using grow lights is that you avoid the temperature and light intensity changes that will occur in window-side gardens.

Water - All plants need water, however, more plants die from overwatering than underwatering. Try to put drainage holes in the bottom of all containers, but if this is not possible, watch your watering schedule extra carefully. Adding sand (not beach sand, it's too salty) or vermiculite to the soil will make it lighter and provide better drainage. Most plants need to dry out, at least slightly, between waterings.

Soil - A purchased planting mix is the safest medium to use in the classroom. These mixes have been sterilized and treated to reduce the dangers of plant diseases or fungus that might be encountered in the use of garden soil. If you want to use the garden soil, be sure to lighten it with sand or vermiculite. Plant roots need air as much as they need water. The proper balance is what makes for a healthy plant.

You might want to consider eliminating the problems of soil and overwatering all together by trying a hydroponic garden. Many plants will grow well in water alone. For best results, use distilled or spring bottled water and keep the plants out of direct light to decrease the growth of algae. You can purchase a bottle of "Hyponex" to add nutrients to the water if you are going to grow them for a long period of time. Activated charcoal bits (same as aquariums use) will keep the water sweeter and lenghten the amount of time between water changes.

Obtaining Plants - You can purchase potted plants, bedding plants, bulbs, and seeds from many stores and nurseries. For less expensive sources consider cuttings from friends, propagation from a large plant, and kitchen seeds such as beans, fruit seeds, nuts, etc. Free seeds are also available from some companies for school use. Check with seed companies and local conservation groups for other sources. (See page 748 - Redwood Trees).

Problems (Perils) - Insect pests, such as aphids and mealy bugs, may show up on your plants especially if they are donations from various sources. They can usually be controlled or eliminated by dipping the leaves into a solution of soapy water. If the plant does become infected, be sure to quarantine it to prevent the insects from spreading to the other plants.

Vacation periods - Temporary green houses can be made by placing a clear plastic bag over each plant. These green houses will keep the plant with enough water for at least a week. For longer periods students may wish to earn the right to become a 'plant' sitter.

Poisonous plants - Students, especially in the primary grades, should be reminded to never put any part of a plant in their mouths. The leaves, stems, flowers, and/or berries of many common plants are extremely toxic. Beans from the castor plant, daffodil bulbs, and mistletoe berries can be fatal to small children and many others can cause skin irritations. Students should learn that although all food comes from plants, not all plants are food.

The following projects have been tried successfully in many classrooms. They can be selected as individual or group projects.

Page	Project	Suggested grade levels
738	Eggheads	1 - 4
739	Forcing Bulbs to Bloom	1 - 6
740	Fruitful Seeds	1 - 6
741	Greenhouse Gardens	1 - 6
742	Sponge Gardens	1 - 3
743	Tin Can Gardening	1 - 6
744	Bottle Gardens (Terrariums)	4 - 6
745	Sack of Potatoes	2 - 6
746	Pineapple Twist	3 - 6
747	Plants for Peanuts	4 - 6
748	Redwood Trees	3 - 6
749	Sun Flowers	1 - 6
750	Herbs	1 - 6
751	Gourds	1 - 6
752	Cactus	4 - 6
753	Bibliography	

EGGHEADS

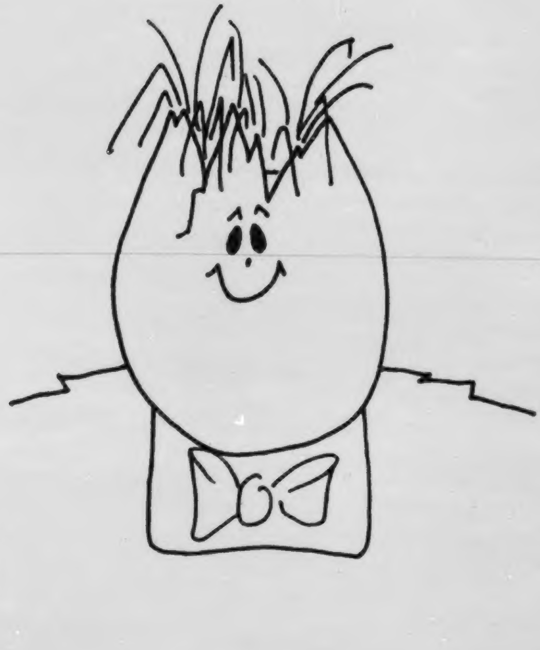
Growing sprouts (bean, grass, bird seed, etc.) is a fast method of helping children to understand that all plants need water to grow.

Making eggheads adds a little fun and excitement to the process. Here's what to do.

Have the children bring in egg shells that are 3/4 whole. Have extras on hand as some will surely break during the decorating session. Make faces on the shells with felt tip pens or poster paint, keeping the open end up. When the faces dry, carefully fill the shells with planting mix. It should go all the way to the top edges of the shell. Sprinkle grass seed evenly over the surface and pat gently into the soil. Water them carefully but generously. Put your eggheads in a carton and place them by a sunny window.

Before long, every baldy will be sporting a crop of healthy, green hair.

For extras you can use paper tubes from bathroom tissue or paper towels to make individual holders. Children can decorate the tubes with collars, ties, shirts, jewelry or whatever they choose.



"Forcing" Bulbs to Bloom Indoors

You can bring Spring into your classroom ahead of schedule by forcing bulbs and/or corms to bloom early.

Most bulbs that are hardy for outdoor planting can be forced to bloom by controlling the temperature and light during the growing period. Bulbs such as tulips, hyacinths, daffodils, crocus, narcissus, and ranunculus can be forced to bloom by several methods.

In Water -

Hyacinths grow well in water alone. Only the base of the bulb should touch the water, so if your jar is too big use toothpicks to hold the bulb. Be sure to refill the jar as the water evaporates to keep the water level even with the base of the bulb. Add a few bits of activated charcoal to keep the water sweet.

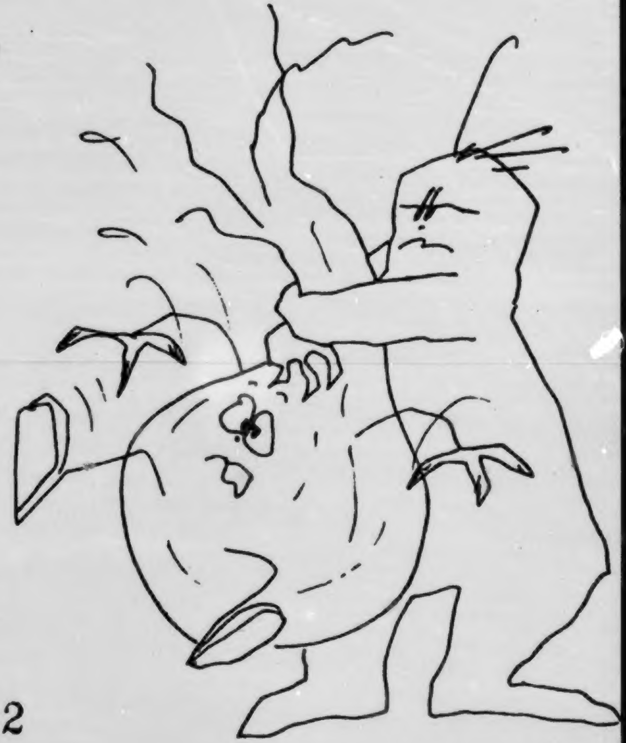
In Pebbles and Water -

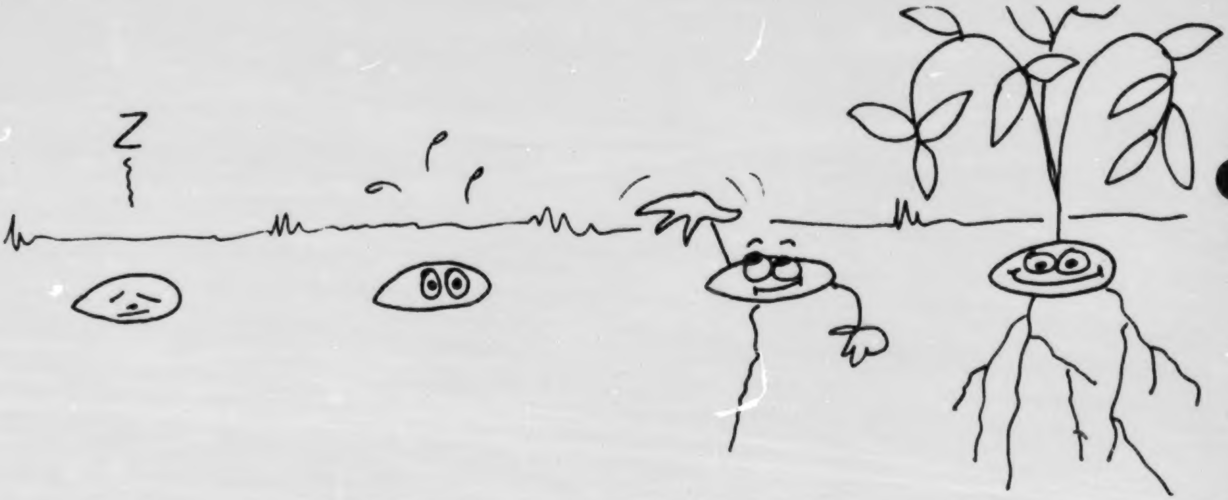
Place a two inch layer of clean pebbles in a bowl or dish about three inches deep. Set the bulbs so that the lower half is under the pebbles. Fill the container with water until it is level with the base of the bulbs. Again, check the water level for evaporation and add more water if necessary. Narcissus varieties are best for this method.

In Soil -

Use clean pots and cover the drainage hole with pieces of broken crockery or pebbles. Add soil mixture and set bulbs close to each other with tips about an inch below the surface.

After planting with one of the methods above, water well and place in a dark, cool area. Leave them for eight to ten weeks, checking occasionally to see that the soil is still moist, and then bring them into a warm room. Keep them under a paper bag until the leaves are several inches high. Then move them to a sunny window and water freely.





FRUITful SEEDS

Many fruit seeds will grow easily in the classroom. Children can collect seeds from the kitchen at home or save them from their lunches at school. This is an inexpensive and easy way for children to see and understand the growth cycle of a plant.

Citrus seeds, such as grapefruit, oranges, and lemons, should be washed and planted quickly to insure germination. Other softer seeds, like cantaloupe and honeydew melon, can be allowed to dry and stored in the refrigerator before planting.

You can grow almonds, walnuts and dates that have not been processed (roasted, salted, etc.) too. These will take a little longer to sprout but make beautiful plants.

Seeds from stone fruits, such as cherries, peaches, and apricots, need to be washed thoroughly before planting. They are the slowest to germinate.

Plant the seeds in a planting mix and allow for good drainage. Used paper cups with a hole punched in the bottom make good, inexpensive containers for most seeds. It's a good idea to plant several seeds in each container because some will not germinate. Water them well and cover with a thin layer of plastic wrap to help hold in the moisture. When the seeds begin to sprout, remove the plastic and move the plants to a place where there is plenty of light and sun.

(If you plant a variety of seeds, be sure to label your containers.)

GREENHOUSE GARDENS

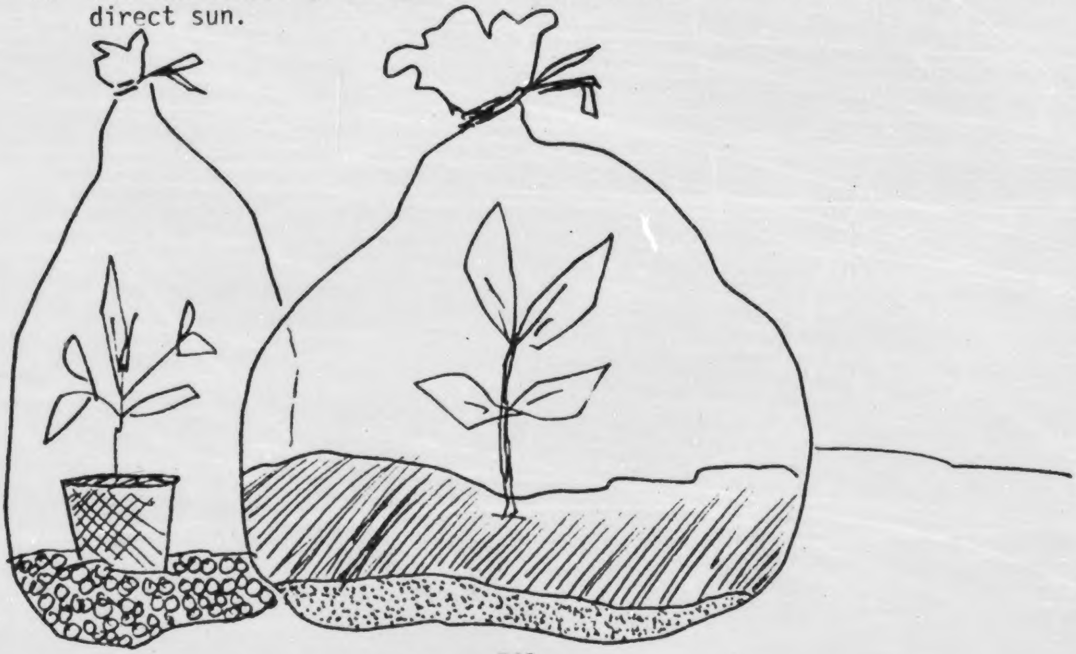
If you have a plastic bag, you can have your own individual greenhouse.

Here's what you need:

- A plastic bag, a quart size is good.
- Planter mix
- A peat pot (any kind of container will work, but you can plant the peat pot later)
- Pebbles or a little sand for drainage
- Water
- A plant cutting

Here's what to do:

1. Put a little sand or a few pebbles in the bottom of the plastic bag.
2. Fill the peat pot (or container) with planter mix.
3. Carefully plant the cutting.
4. Add water so that the planting mix is moist.
5. Put the pot in the plastic bag. Tie the top of the bag closed with a rubber band or the twist type bands that come with purchased plastic bags.
6. Set the closed greenhouse in a place where it will get light but not direct sun.



SPONGE GARDENS

Materials needed:

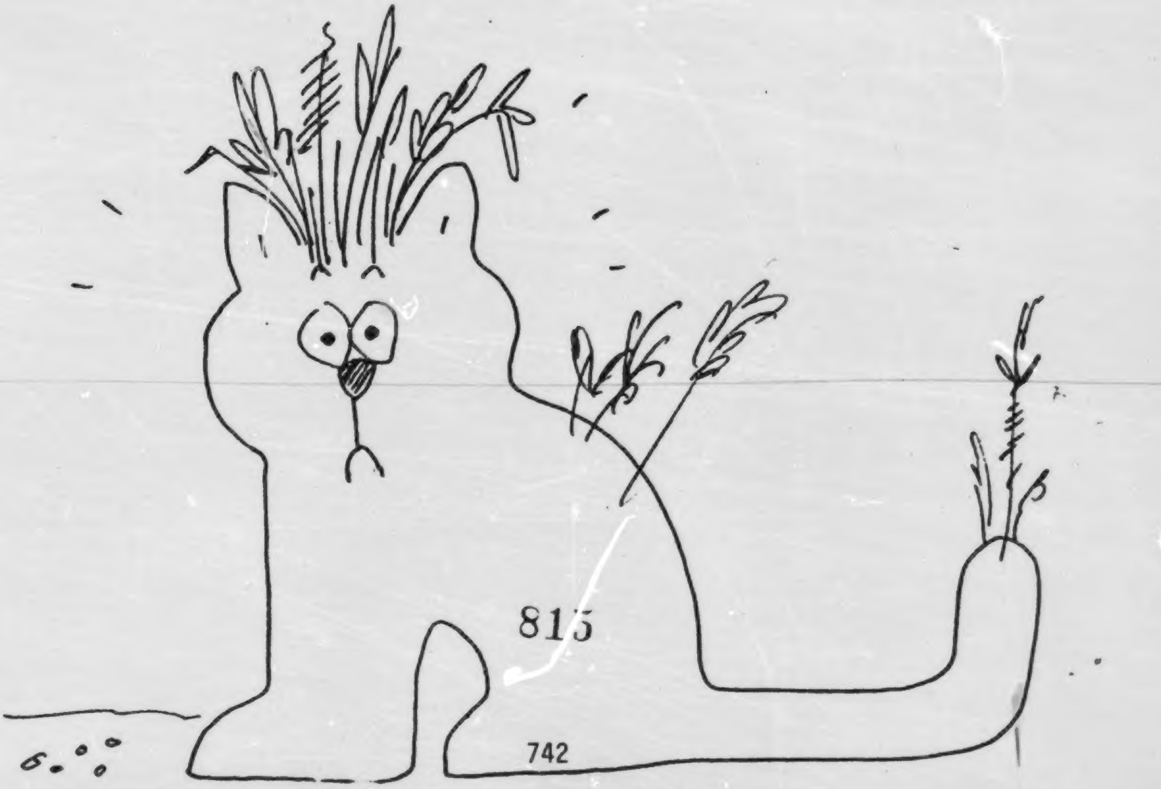
- A flat, thin sponge
- Water cress seeds (or mustard)
- Aluminum pie plate
- Water
- Scissors

Directions:

1. Cut sponge into animal or tree shape. (Left over pieces of sponge are great for sponge painting or crystal gardens.)
2. Put sponge shape in pie plate and add water.
3. Sprinkle seeds on top of sponge.
4. Add water to keep sponge moist.

Seeds will sprout to form fuzzy green hair for your animal or pretty green leaves for your tree.

Snip off the green plants as they grow and add them to your sandwich for lunch.



TIN CAN GARDENING

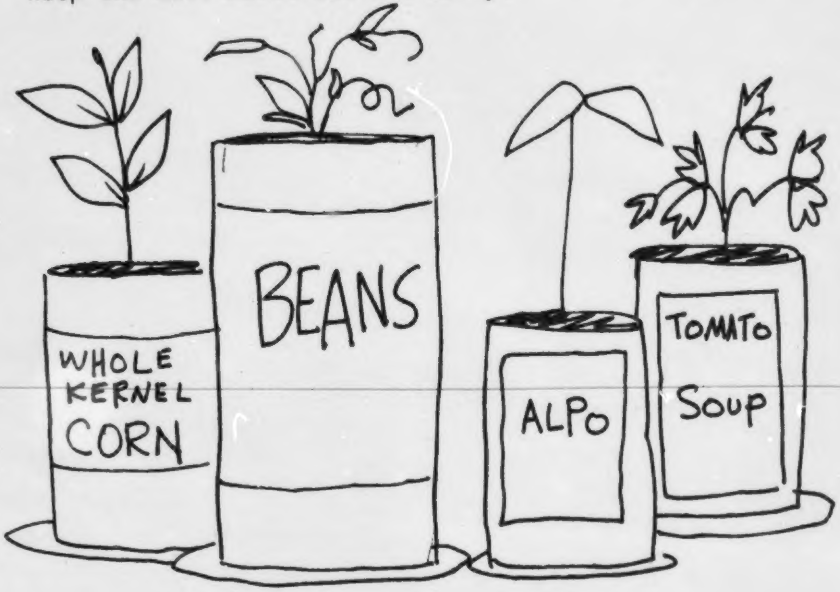
Here's a good way to recycle old tin cans and make a pretty garden for your kitchen at the same time.

Materials:

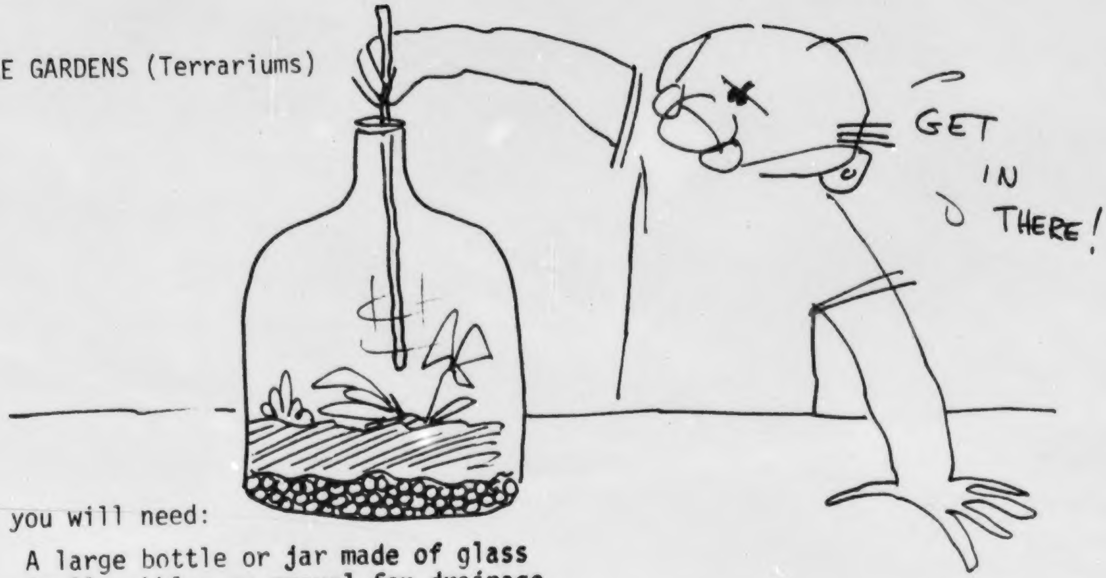
- Empty vegetable cans - Leave the labels on for color
- Gravel or small pebbles for drainage
- Hammer and nail
- Planting mix
- Seeds -tomatoes, beans, peas
- Aluminum pie plate or saucer to catch drain water

How to do it:

1. Use hammer and nail to punch holes in the bottom of the can.
2. Put a layer of gravel or pebbles in the bottom of the can.
3. Add planter mix to about one inch from top of can.
4. Plant seeds, following directions on the package. Match the seeds to the can label, if you can.
5. Water. Keep the can on a light window sill and add water to keep the soil moist but not soggy.



BOTTLE GARDENS (Terrariums)



What you will need:

A large bottle or jar made of glass
Small pebbles or gravel for drainage
Planter mix
A few pieces of activated charcoal (the kind used for aquariums)
Small plants or plant cuttings
A long stick (chopsticks work well)

What to do:

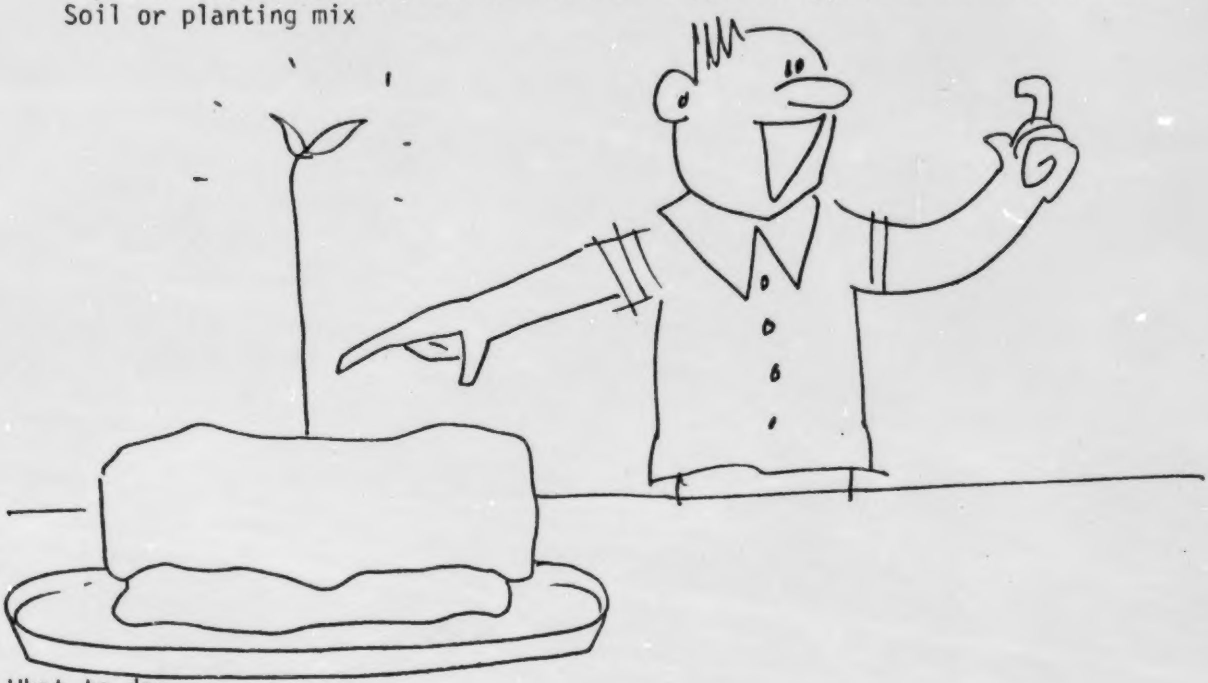
1. Wash the bottle or jar well. Remove the label if there is one.
2. Put a layer of clean pebbles or gravel in the jar for drainage.
3. Carefully add the planting mix to fill about 1/4 of the jar. Add the charcoal to the planting mix to keep the soil sweet.
4. Use the long stick to make little holes in the soil. Plant the plants or cuttings in the holes and gently tamp the soil around them.
5. Sprinkle a little water into the jar. Bottle gardens do not need to be watered often as there is little evaporation.
6. Keep the garden in a light place but not in direct sunshine.

(You can make a good 'tamping' tool by wrapping a small piece of cloth around the end of the stick and securing it with a rubber band.)

A Sack of Potatoes

Things you will need:

2 or 3 white potatoes
a sturdy plastic trash can liner (about 17"x18")
gravel or small pebbles for drainage
a pan or saucer to catch the drain water if you're going to do this indoors.
Soil or planting mix



What to do:

Fold the plastic bag over at the top a couple of times to make a three inch cuff so that the bag will stay open neatly at the top. Put about ½ inch of gravel in the bottom of the bag and punch a few holes in the bottom to allow for drainage. Add soil up to within three inches of the top. Cut the potatoes into pieces so that eacy piece has two or three eyes (buds). Plant these pieces in the bag about four inches apart. Cover the potatoes with a few inches of more soil.

Water and put the bag in a sunny place. If you plant your potatoes in March or April, you will have a sack full of potatoes by the fall.

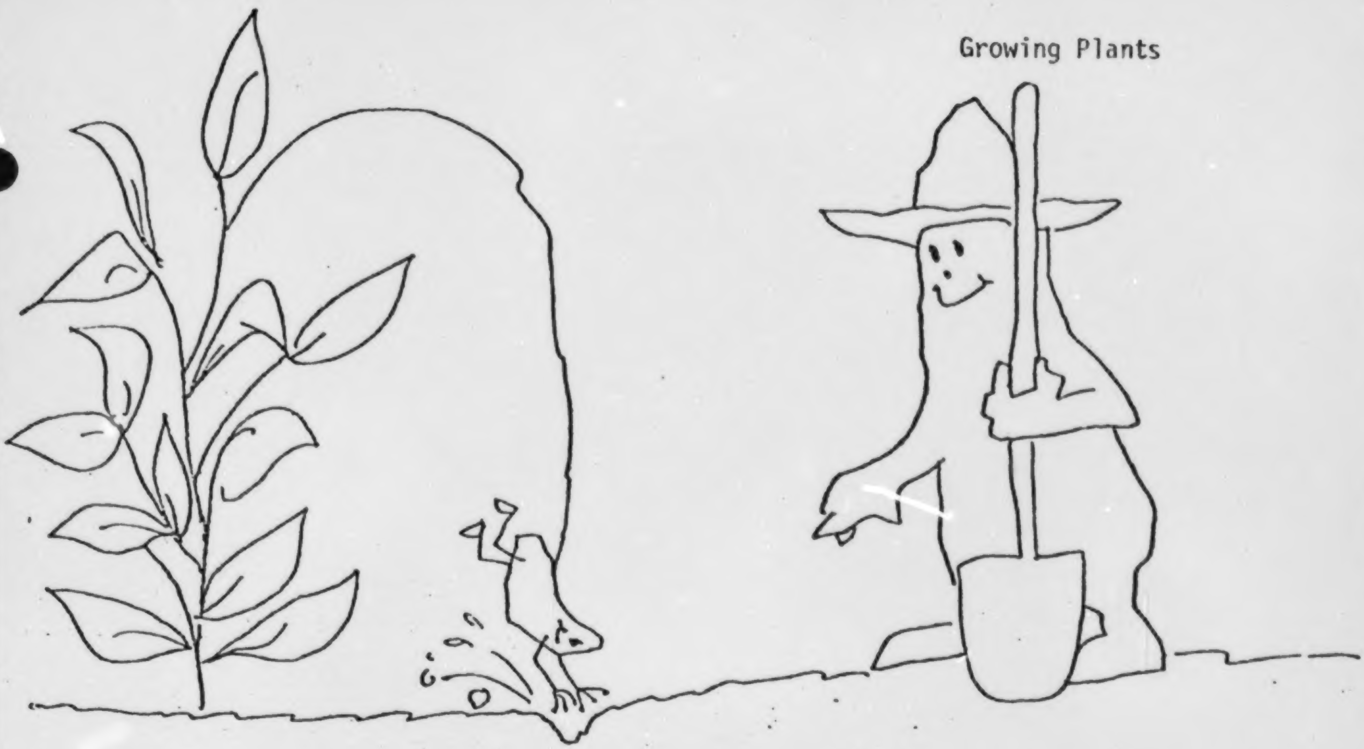
Pineapple Twist

Here is a new way to start a pineapple plant. Instead of cutting off the top with an inch of the fruit (which is the usual way), simply twist off the top part that is the stem and the leaves. Remove the lower leaves to expose the stem about 1½ to 2 inches. Place the top in a small glass and fill with water to the lowest remaining leaves. Keep the water at this level by adding more when needed.

The first roots should form within a week. When the glass is about half filled with strong roots, transplant the pineapple into a pot filled with soil. A regular clay flower pot works fine and can be filled with half soil and half vermiculite or peat moss. Be sure to allow for drainage in the bottom of the pot.

You can make the plant bloom by placing the whole thing (pot and all) in a large plastic bag. Add a ripe apple to the bag and twist the top closed. Don't open the bag for at least five days. The apple releases a gas as it ferments which gets the pineapple started in blooming. After five days, take the pineapple plant out of the bag and care for it as you would any other plant. Within two or three months, the pineapple will flower. With luck, you may even get a baby pineapple from the blossom.

SUPER
DIRT
PLANT
MIX
PEAT
MOSS

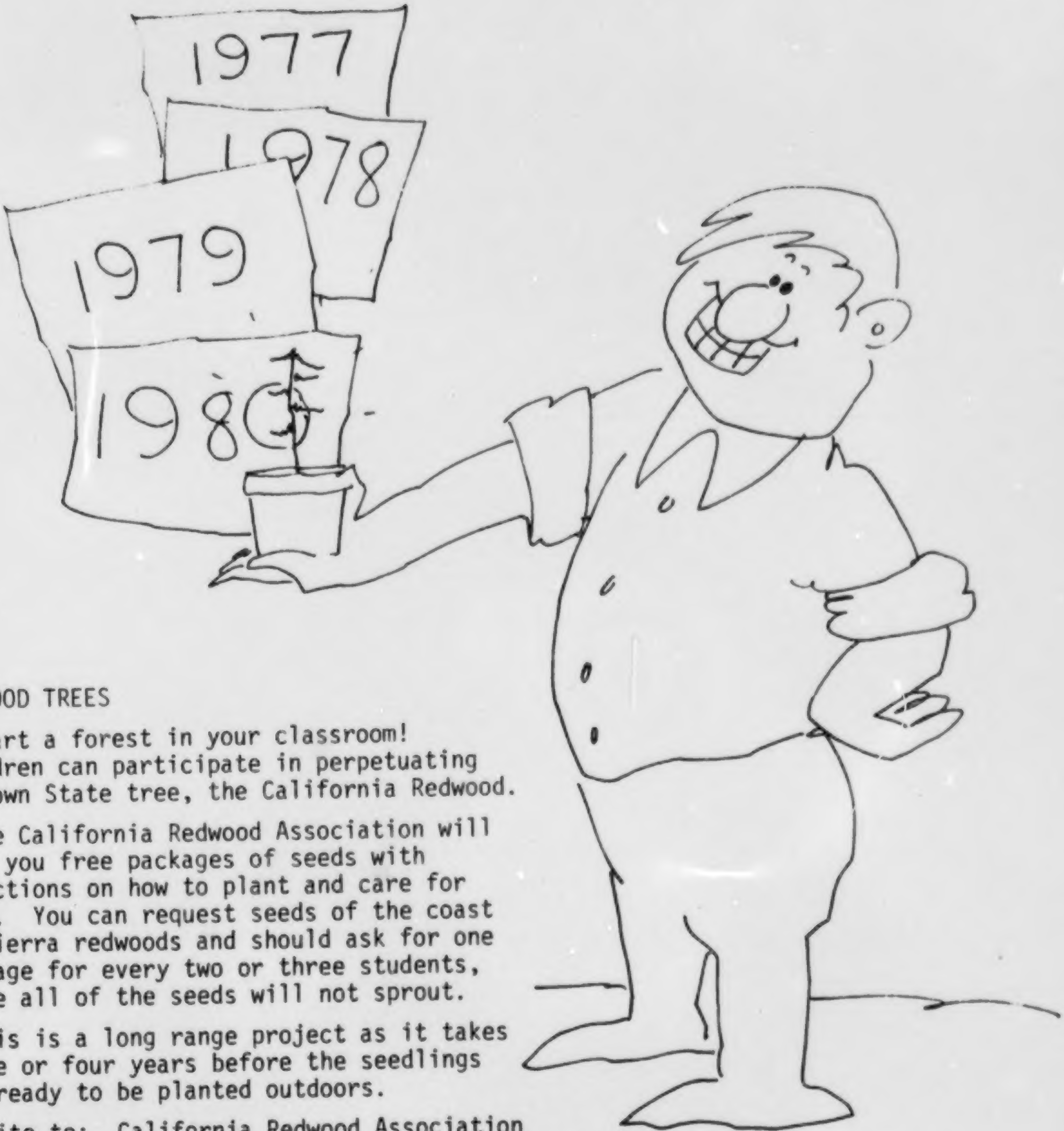


GROWING PLANTS FOR PEANUTS

What You Need: Unshelled raw peanuts (not roasted), small glass jar, piece of yarn, potting soil, 8" pot.

How To Do It: Carefully remove the shell and take out the peanuts. Be sure to leave the red skin on. Soak the peanuts in water overnight. The next day put the peanut on top of some yarn in a jar. Add a teaspoon of water and check every day to keep the yarn moist. Soon the nut will grow a root. When the root is three inches long, plant the peanut in an 8" pot. In about seven weeks the plant will grow yellow flowers. After each flower pollinates, it will fall off. A sort of green finger called a peg will emerge and find its way back into the soil. That's the part that will become the peanut. In another four to six weeks, when the green part of the plant begins to turn brown, it's time to harvest the peanuts. Take hold and pull the whole plant up. Let the plant dry in the air for a few weeks, then remove the peanuts.

If you want to roast your peanuts, soak them in salted water overnight. Then spread them in one layer on a cookie sheet and put it in the oven at 350° for about 30 minutes.



REDWOOD TREES

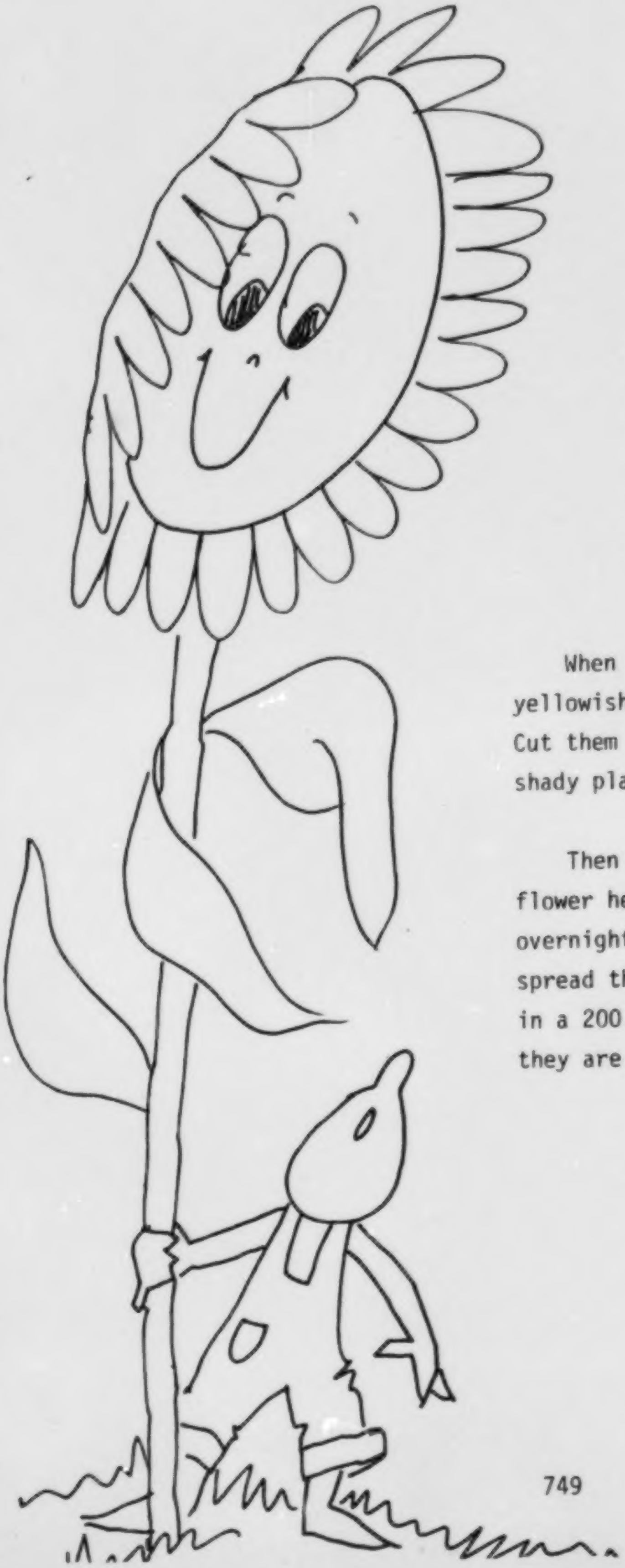
Start a forest in your classroom! Children can participate in perpetuating our own State tree, the California Redwood.

The California Redwood Association will send you free packages of seeds with directions on how to plant and care for them. You can request seeds of the coast or Sierra redwoods and should ask for one package for every two or three students, since all of the seeds will not sprout.

This is a long range project as it takes three or four years before the seedlings are ready to be planted outdoors.

Write to: California Redwood Association
1 Lombard Street, San Francisco, CA 94111

(They will also send a teacher's conservation kit which provides information about the history and production of the redwoods.)



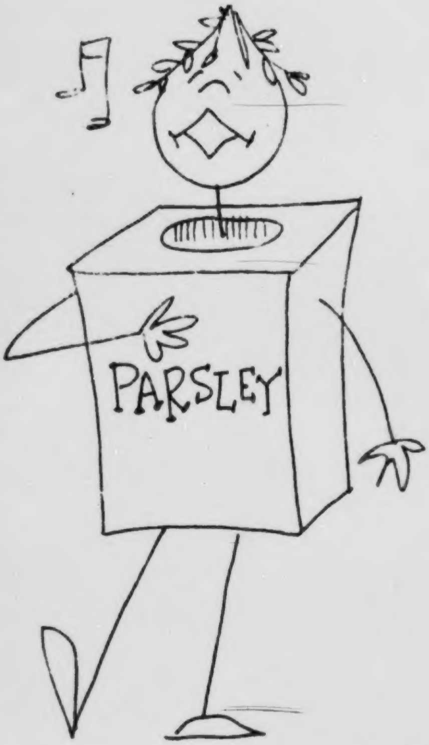
Growing Plants

SUNFLOWERS

Sunflowers are easy to grow. Choose a place in your yard where there is sunshine most of the day. Dig a little hole and plant the seeds about ½ inch deep. If you are planting several, keep them about one foot apart. Water them well and in about two weeks the seeds will sprout.

When the backs of the flowers turn yellowish, they are ready to be harvested. Cut them and hang them up to dry in a cool, shady place for two or three days.

Then remove the dried seeds from the flower heads and soak them in saltwater overnight. The next day drain them and spread them on a cookie sheet. Roast them in a 200 degree oven for 1½ hours or until they are crisp.



HERBS

Herbs (usually pronounced 'erbs') have been used by people for thousands of years. The leaves and stems of herbs are still used for medicines, seasonings, food, perfume, and even disinfectants.

Growing herbs can provide materials for a wide variety of classroom projects. Herbs,such as anise, mint, garlic, and sage,can be part of a 'smell and tell' collection. Children can identify the herb that smells like chewing gum (spearmint and peppermint), the licorice one (anise), and the herb that reminds them of Thanksgiving dinner (sage).

Other herbs, such as lavender and lemon balm, are good for making potpourri balls or sachets.

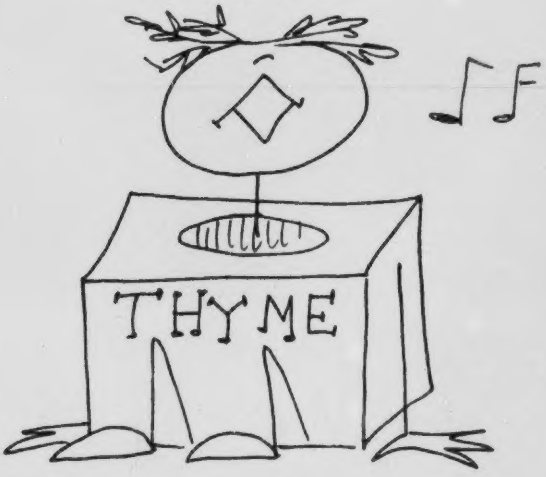
Growing catnip offers the opportunity of making a toy for a favorite kitty.

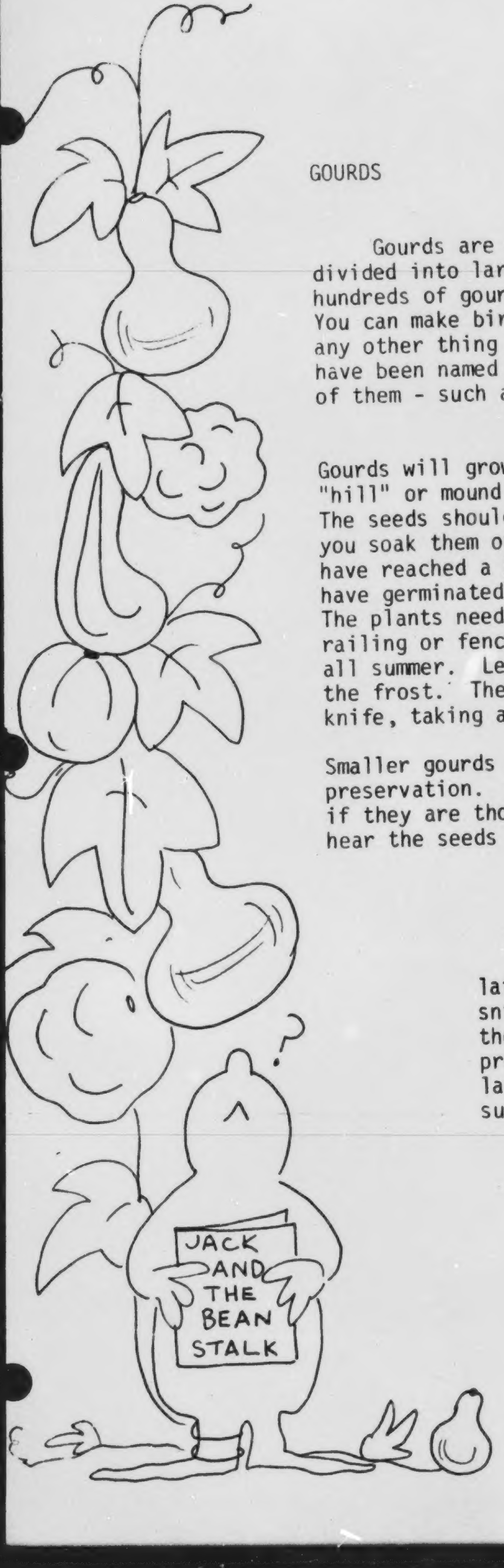
Herbs can be purchased in small pots from the nursery or can be grown in the classroom from seeds. They like soils that are loose (part sand and peat moss) and have good drainage. Most herbs like sun so be sure to keep them in a location with good light.

Some easy growing herbs for the classroom are anise, basil, catnip, dill, garlic, lavender, mint, lemon balm, oregano, and, of course, parsley, sage, rosemary, and thyme.

SAGE
ROSEMARY

Note: Mint grows well in water alone.




JACK AND THE BEAN STALK

GOURDS

Gourds are easily grown from seed. Seeds are usually divided into large and small types, both which will provide hundreds of gourds varying in shape, texture, and color. You can make birdhouses, dippers, candleholders, bowls and any other thing you can think of. Some varieties of gourds have been named according to the use most frequently made of them - such as birdhouse gourds, spoon gourds, etc.

Gourds will grow best outdoors. Plant 3 to 5 seeds to a "hill" or mound of soil after danger of frost has past. The seeds should germinate withing a week - sooner if you soak them over night before planting. After the seedlings have reached a height of 2-3 inches, and when all the seeds have germinated, snip off at ground level all but the hardiest. The plants need running room and support such as a trellis, railing or fence. Water regularly and the vine will grow all summer. Let the gourds remain on the vine until after the frost. Then pick or cut from the dry vines with a sharp knife, taking a short part of the stem along with the gourd.

Smaller gourds will require no special treatment for preservation. They need only to be air dried. You can tell if they are thoroughly dry by shaking them. When you can hear the seeds rattling around inside, then they are ready.

Indoors - Plant seeds in 6 inch pots in late February or early March. After germination snip off all but the hardiest as above. Place the seedling in a sunny window and be sure to provide support for the vine. Transplant to a larger container, if necessary, and keep in the sun or as much brightness as possible.

THE CACTUS

The cactus family is just one of many groups of plants that are called succulents.

They are interesting because of their many ways of changing and adapting to their environment. Some succulents have changed their shape to conserve water, some have developed sharp bristles and spines for protection, some have produced poisonous or bad tasting juices, and others have even disquised themselves to look like pebbles and rocks.

Cacti (more than one cactus) originally grew in the desert areas of North and South America. They can survive in the hot desert because of their ability to store water. Some barrel cacti, for example, can live for more than a year on just one full load of water.

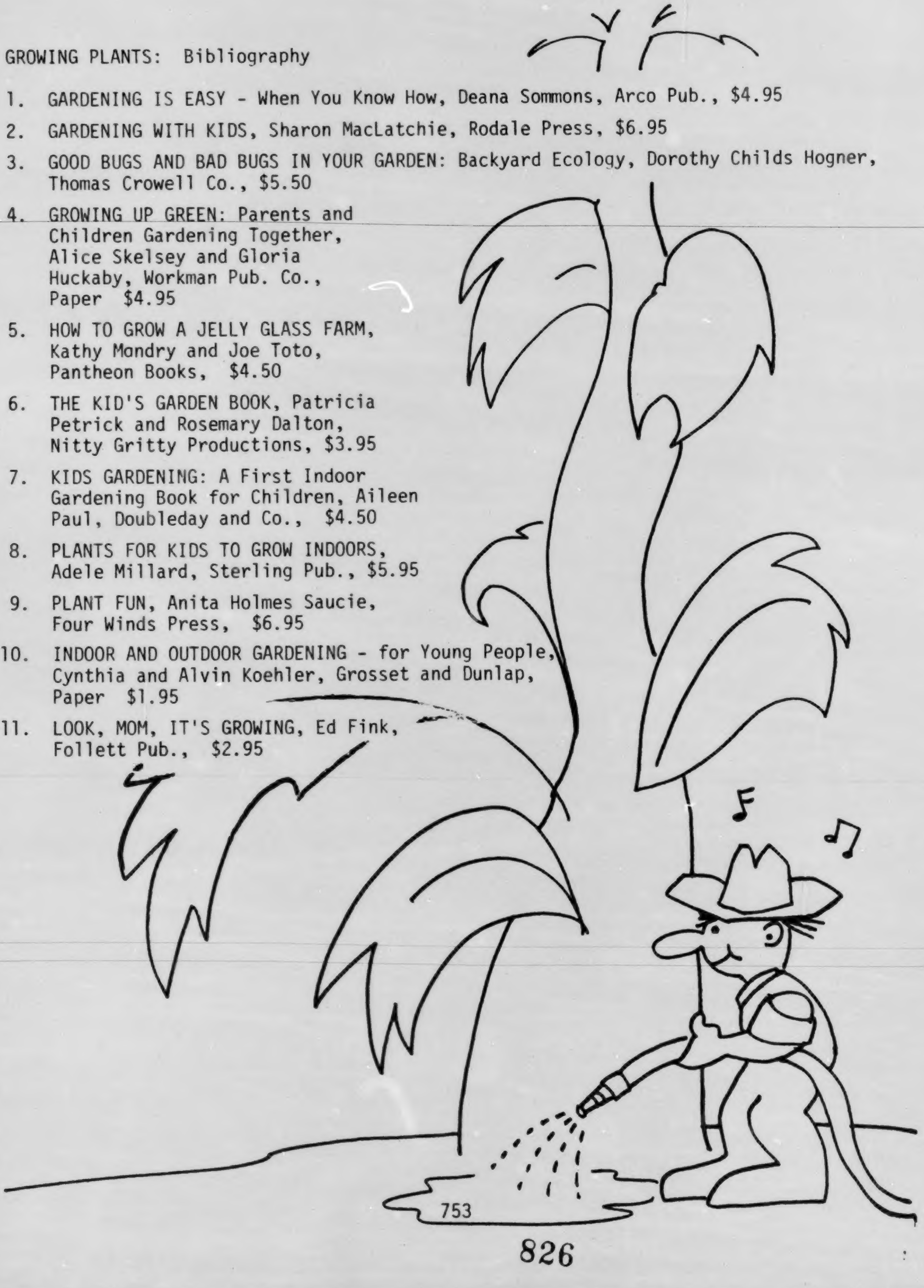
The thorns and spines of the cactus are all that remain of the leaves. The thick green stem of the plant stores moisture and manufactures the food.

Because of their ability to change and adapt, cacti have survived for thousands of years.

You can grow your own cactus from seeds. First make a mixture of two parts sand and one part planting mix. Put this in a shallow pot or dish and sprinkle the cactus seeds on top. Cover them lightly with a little more sand. Carefully water and cover the pot with clear plastic wrap until the seedlings appear. Don't put your plant in the sun until the seedlings are fairly well grown. Then, remember to watch out for thorns!

GROWING PLANTS: Bibliography

1. GARDENING IS EASY - When You Know How, Deana Sommons, Arco Pub., $4.95
2. GARDENING WITH KIDS, Sharon MacLatchie, Rodale Press, $6.95
3. GOOD BUGS AND BAD BUGS IN YOUR GARDEN: Backyard Ecology, Dorothy Childs Hogner, Thomas Crowell Co., $5.50
4. GROWING UP GREEN: Parents and Children Gardening Together, Alice Skelsey and Gloria Huckaby, Workman Pub. Co., Paper $4.95
5. HOW TO GROW A JELLY GLASS FARM, Kathy Mondry and Joe Toto, Pantheon Books, $4.50
6. THE KID'S GARDEN BOOK, Patricia Petrick and Rosemary Dalton, Nitty Gritty Productions, $3.95
7. KIDS GARDENING: A First Indoor Gardening Book for Children, Aileen Paul, Doubleday and Co., $4.50
8. PLANTS FOR KIDS TO GROW INDOORS, Adele Millard, Sterling Pub., $5.95
9. PLANT FUN, Anita Holmes Saucie, Four Winds Press, $6.95
10. INDOOR AND OUTDOOR GARDENING - for Young People, Cynthia and Alvin Koehler, Grosset and Dunlap, Paper $1.95
11. LOOK, MOM, IT'S GROWING, Ed Fink, Follett Pub., $2.95



MUSIC

Music has always been used to tell stories and express feelings. Many currently popular songs have 'conservation' messages as do old standards such as 'Puff, the Magic Dragon', 'Home on the Range', and 'Don't Fence Me In'.

Students can learn these songs or write their own lyrics to familiar songs. Classes can be divided into small groups of 'composers' and share their creations in a song fest. For example, 'On top of old Smokey, all covered with snow...' can easily be changed to 'On top of St. Helens, all covered with ash....'.

You can also combine music and crafts to create your own instruments from recycled materials. Coffee cans with rubber inner-tubes or heavy balloons secured over one end have often been used for drums, aluminum pie plates filled with a few pebbles and stapled together make good tambourines and different sizes of clay pots or glasses filled with graduated levels of water create zylophones.

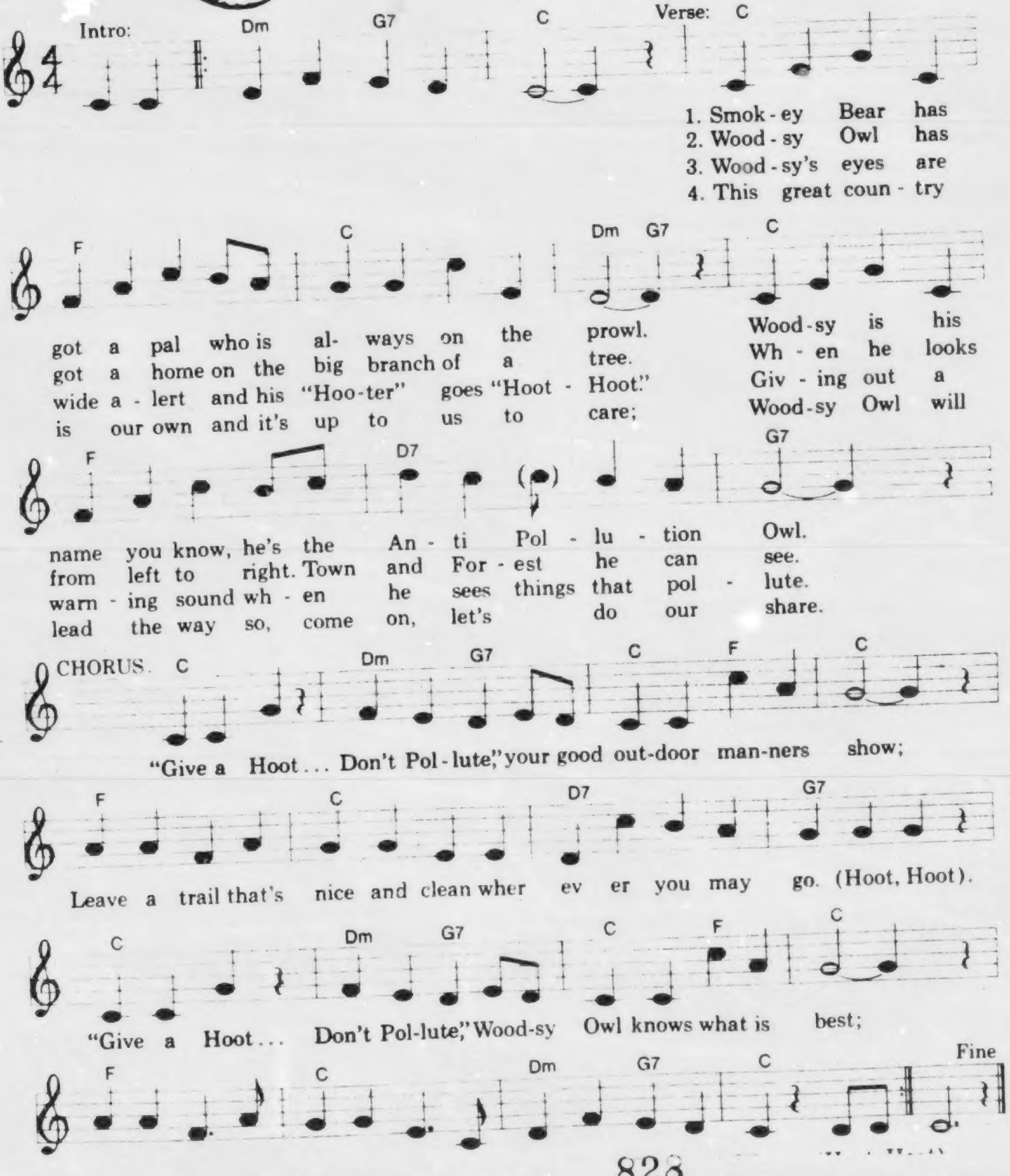
The songs included here are intended as a starting off place. If your students create a song or new lyrics to an old song, you may wish to send it to the Northern California/Nevada Regional Conservation Committee (address is included in bibliography) for possible inclusion in their second edition of the Sierra Club Songbook.

Page	Title
756	The Ballad of Woodsy Owl
757	Help Woodsy Spread the Word...
758	Never Be a Litter Bug
759	It's A Small World
760	This Land Was Made For You and Me?
761	Help Clean Up the Air
762	Oh, What a Beautiful Morning - Three Little Styrofoam Cups
763	Where Does All My Garbage Go?
764	Bibliography

GIVE A HOOT!
DON'T POLLUTE

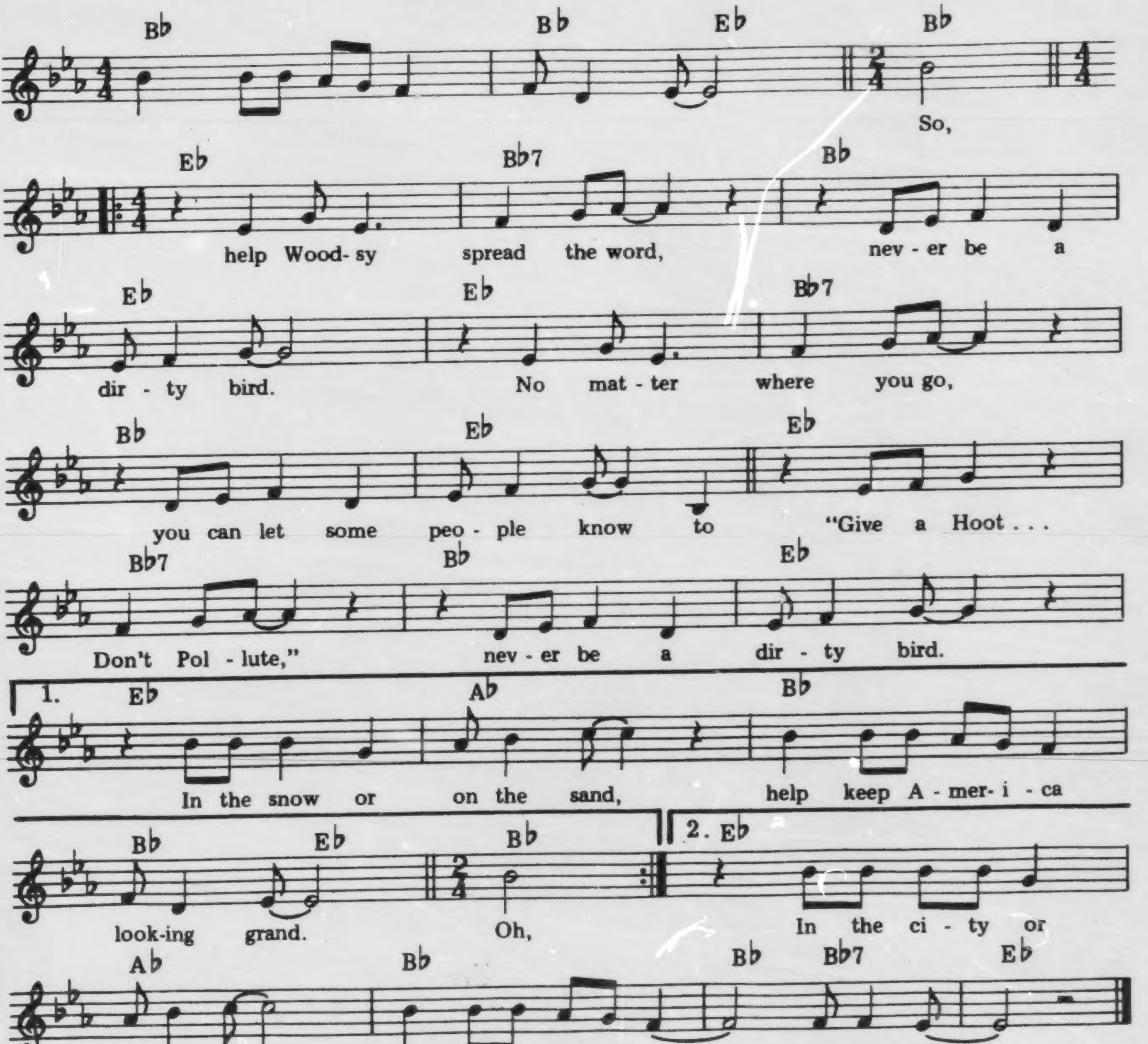
THE BALLAD OF WOODSY OWL

Written by Marion Bartoo   Arranged by Dave Kimber & Bob Pelli


Intro:
Dm G7 C
Verse: C
1. Smok-ey Bear has got a pal who is al- ways on the prowl. Wood-sy is his name you know, he's the An - ti Pol - lu - tion Owl.
2. Wood-sy Owl has got a home on the big branch of a tree. Wh - en he looks from left to right. Town and For - est he can see.
3. Wood-sy's eyes are wide a - lert and his "Hoo-ter" goes "Hoot - Hoot." Giv - ing out a warn - ing sound wh - en he sees things that pol - lute.
4. This great coun - try is our own and it's up to us to care; Wood-sy Owl will lead the way so, come on, let's do our share.
F C Dm G7 C F D7 G7
CHORUS. C Dm G7 C F C
"Give a Hoot... Don't Pol-lute," your good out-door man-ners show;
F C D7 G7
Leave a trail that's nice and clean wher ev er you may go. (Hoot, Hoot).
C Dm G7 C F C
"Give a Hoot... Don't Pol-lute," Wood-sy Owl knows what is best;
F C Dm G7 C
Fine

Give a hoot! Don't pollute!

Help Woodsy spread the word...


Bb Bb Eb Bb
So,
Eb Bb7 Bb
help Wood- sy spread the word, nev - er be a
Eb Eb Bb7
dir - ty bird. No mat - ter where you go,
Bb Eb Eb
you can let some peo - ple know to "Give a Hoot . . .
Bb7 Bb Eb
Don't Pol - lute," nev - er be a dir - ty bird.
1. Eb Ab Bb
In the snow or on the sand, help keep A - mer- i - ca
Bb Eb Bb 2. Eb
look-ing grand. Oh, In the ci - ty or
Ab Bb Bb Bb7 Eb
in the woods, help keep A - mer- i - ca look-ing good.

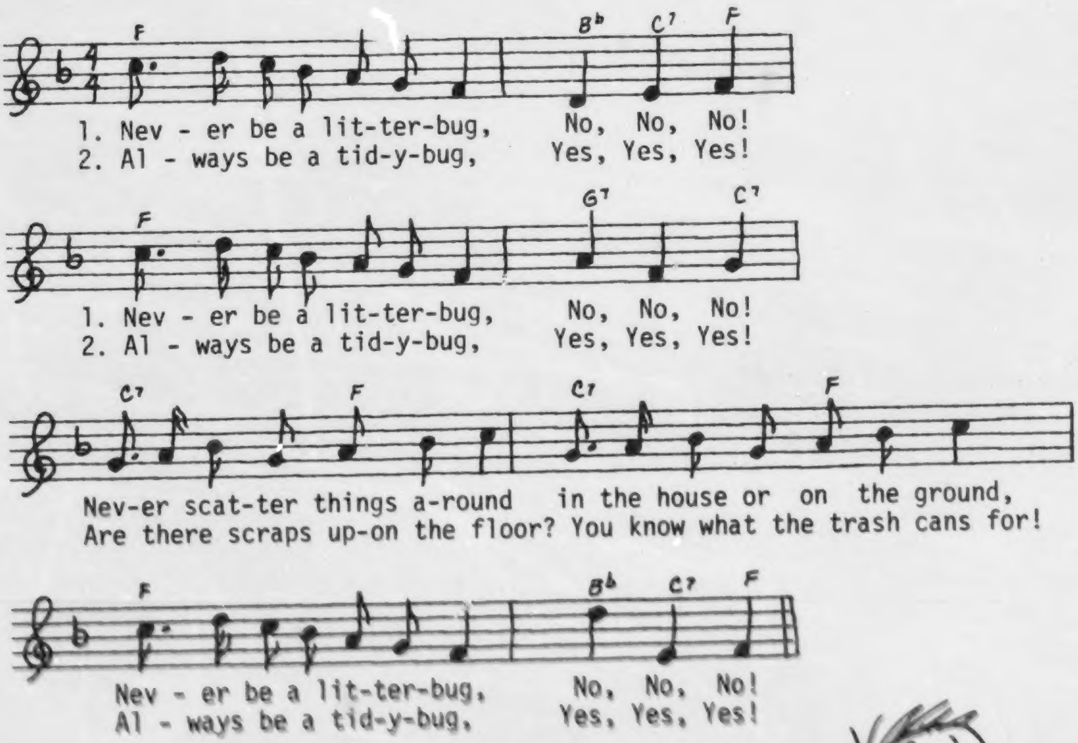
©1975 Ogilvy & Mather Inc

GPO 1978 O - 255-139

Never Be a Litterbug

Words and music by
Catherine Y. Hoagey

From the Instructor Magazine
April, 1963


F
B♭ C7 F
1. Nev - er be a lit-ter-bug, No, No, No!
2. Al - ways be a tid-y-bug, Yes, Yes, Yes!
F
G7 C7
1. Nev - er be a lit-ter-bug, No, No, No!
2. Al - ways be a tid-y-bug, Yes, Yes, Yes!
C7 F C7 F
Nev-er scat-ter things a-round in the house or on the ground,
Are there scraps up-on the floor? You know what the trash cans for!
F B♭ C7 F
Nev - er be a lit-ter-bug, No, No, No!
Al - ways be a tid-y-bug, Yes, Yes, Yes!

830

Learn the song "It's A Small World" by Sherman and Sherman, Walt Disney, Inc.

Then sing these additional verses by Mary Hallesy and the 1976 LeConte Lodge Summer Staff.

1. There is just so much water and so much air
   And just so much land and food everywhere
   There's so much we must share, oh it's time we're aware
   It's a small world after all. (Chorus)

2. So many people using up so much so fast
   We cannot go on as we've done in the past
   It is time to confess we have got to USE LESS
   It's a small world after all. (Chorus)

3. On this spaceship earth we are all a crew
   And we've got to learn what we must do
   It is time we're aware we use more than our share
   It's a small world after all!!! (Chorus)

Reprinted by permission, Hidden Villa Inc.
Drawer AH
Los Altos, California

THIS LAND WAS MADE FOR YOU AND ME?

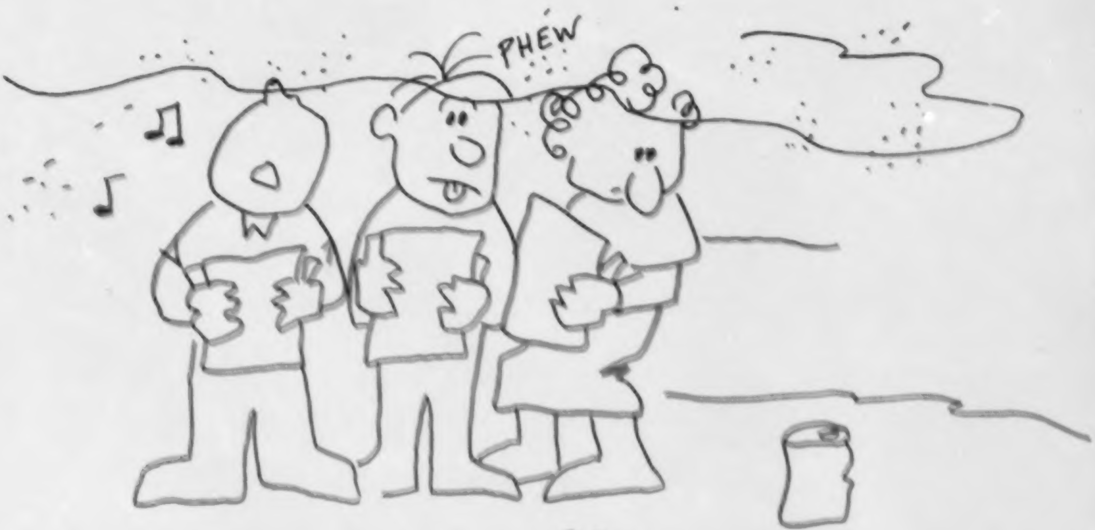
Modern words by Jerry Smith.

Chorus: This land was your land, this land was my land,
From Los Angeles to Coney Island,
From the logged off forests, to the dirty waters,
This land was made for you and me.

1. As I was walking that ribbon of highway,
The sound of chain saws echoed over the skyway,
And the Redwoods falling,
And the loggers calling,
"This land was made for you and me."

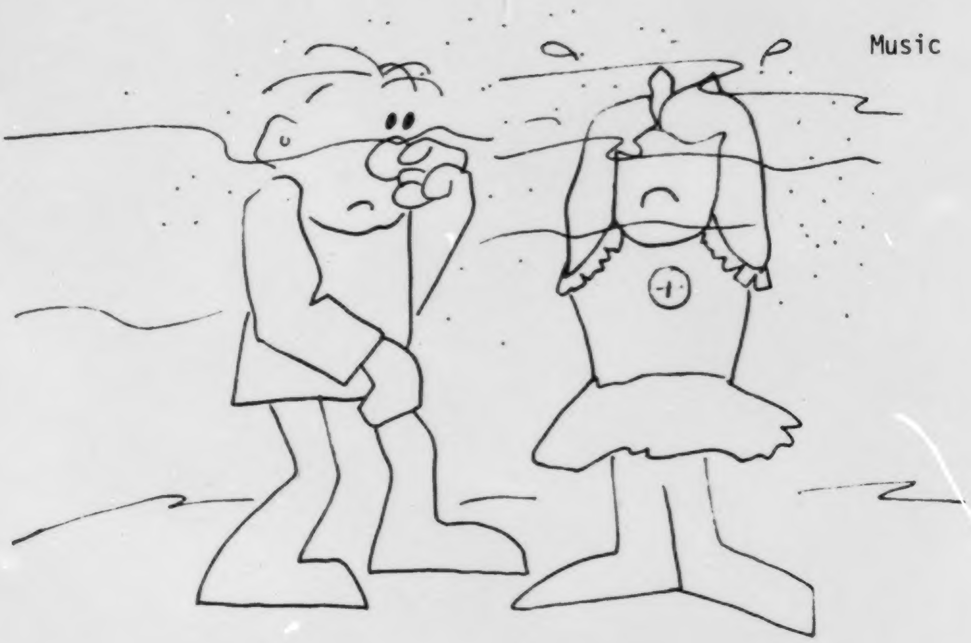
2. I've roamed and rambled,
And I've followed the beer cans,
From the toxic cities to the flooded canyons,
And all around me,
Were billboards reading,
"This land was made for you and me."

3. The sun came shining, but the hazes hid it,
And cloaked the factories and cars that did it,
As the smog was drifting,
Someone was coughing,
"This land was made for you and me."



832

Reprinted by permission from the Sierra Club Songbook.



HELP CLEAN UP THE AIR

(Tune: The Man on the Flying Trapeze)

Smog fills the air with the greatest of ease.
It makes my eyes water and makes my nose sneeze.
(So please stop the smoke from the big factories.)
Help clean up the air that we breathe....

Substitute the following for line three.

(It fills up my lungs and starts me to wheeze.)
(Think twice before using your fireplace chimney.)
(So, tune up your car or walk, if you please.)
(It's bad for the animals, people and trees.)

OH, WHAT A BEAUTIFUL MORNING

Oh, what a beautiful morning,
Oh, what a beautiful day,
The inversion layer has lifted,
I can see clear 'cross the Bay.

There's a brown golden haze over Richmond,
And it's spreading to San Jose.
The smog is so thick, it's making me sick.
Oh, when will the wind come and blow it away?

(Repeat first stanza)

THREE LITTLE STYROFOAM CUPS

Tune: Up on the Housetop

Three little styrofoam cups are we,
Used once at a meeting to hold coffee.
Plastic assures us of immortality.
People think disposing of us is free.

Oh, no, no. That's not so.
Oh, no, no. That's not so.
Three little styrofoam cups are we,
Disposing of us is never free.

Reprinted with permission, Mary Hallesy, Hidden Villa.

WHERE DOES ALL MY GARBAGE GO?

(Tune: Where Have All the Flowers Gone?)

Where does all my garbage go? I've been asking.
Where does all my garbage go? I want to know.
Where does all my garbage go? Fills the bay, don't you know?
When will we ever learn? When will we ever learn?

Where will all the people go? I've been asking.
Where will all the people go? I want to know.
Where will all the people go? Concrete houses, row on row.
When will we ever learn? When will we ever learn?

Where will all the wildlife go? I've been asking.
Where will all the wildlife go? I want to know.
Where will all the wildlife go? Towards extinction, don't you know.
When will we ever learn? When will we ever learn?

Reprinted by permission, Mary Hallesy, Hidden Villa.

Music Bibliography

1. SIERRA CLUB SONGBOOK, published by World Around Songs, Rt. 5, Burnsville, N. C., 28714. Check with local Sierra Club Chapters or write: Northern California/Nevada Regional Conservation Committee, 2253 Park Blvd., Palo Alto, CA 94306. Cost $2.00 plus tax and 50¢ for postage and handling. Includes many traditional campfire songs, many with new verses containing ecology messages.
2. FIRESIDE BOOK OF FOLK SONGS, Margaret B. Boni, Simon and Schuster, Inc., New York, N.Y. 1947. Origins of some songs are included.
3. SING, American Camping Association, Martinsville, Indiana 46151. Pocket size paperback filled with campfire songs.
4. TENT AND TRAIL SONGS, American Camping Association, Martinsville, Indiana 46151. Another paperback campfire song book.
5. GIRL SCOUT POCKET SONG BOOK, Girl Scouts of America, 1956. Available where girl scout equipment is sold.
6. SONGS, designed for Young Life by Songs and Creations, 33 Nokomis Ave., San Anselmo, CA 94960. Cassette tapes, piano and quitar music are available.
7. MANURE TO MEADOW TO MILKSHAKE, Jorgensen, Black and Hallesy. Teaching strategies for the Hidden Villa Environmental Project include many original ecology songs.

(You can also check flea markets and garage sales for old folk albums such as those by Pete Seeger, Peter, Paul, and Mary, and Glenn Yarborough. Many include ecology message songs that will be enjoyed by students.)

CONSERVATION AGENCIES AND LOCAL GROUPS

These agencies and groups may be able to provide additional information or materials. Many of these groups have limited budgets so sending a self-addressed stamped envelope will help and bring a quicker response.

1. CITIIZENS FOR A BETTER ENVIRONMENT, 88 First Street, #600, San Francisco, CA 95105 (415) 777-1984
2. DESERT PROTECTIVE COUNCIL, P.O. Box 4294, Palm Springs, CA 92262 (213)249-2537
3. ENDANGERED SPECIES COMMITTEE OF CALIFORNIA, c/o Ecology Center, 2701 College Avenue, Berkeley, CA 94705 (415) 548-2220
4. ENVIRONMENTAL ACTION CLEARINGHOUSE, Ft. Mason Center, San Francisco, CA 94123 (415) 474-5080
5. ENVIRONMENTAL DEFENSE FUND, 2606 Dwight Way, Berkeley, CA 94704 (415) 548-8906
6. ENVIRONMENTAL VOLUNTEERS, 2253 Park Blvd., Palo Alto, CA 94306 (415) 327-6017
7. ENVIRONMENTAL PROTECTION AGENCY (EPA), Office of Research and Development, Energy, Mineral & Industry, 401 M. St., S.W., Washington, D.C. 20460
8. FARALLONES INSTITUTE, Rural Center, 15290 Coleman Valley Road, Occidental, CA 95465 (707) 874-3060
9. FRIENDS OF ANIMALS, 11W. 60th St., New York, N.Y. 10023
10. FRIENDS OF THE EARTH, 124 Spear St., San Francisco, CA 94105 (415) 495-4770
11. FRIENDS OF THE RIVER, Fort Mason Bldg., San Francisco, CA 94123 (415) 771-0400
12. FRIENDS OF THE SEA OTTER, P.O. Box FF, Carmel, CA 93921 (408) 625-3290
13. FUND FOR ANIMALS, 3925 Sacramento St., San Francisco, CA 94118 (415) 474-4020
14. GREENPEACE, 240 Fort Mason, San Francisco, CA 94123 (415) 441-3993
15. MARINE MAMMAL FUND, P.O. Box 16041, San Francisco, CA 94116 (415) 664-6667
16. NATIONAL AUDUBON SOCIETY, 555 Audubon Place, Sacramento, CA 95825 (916) 481-5332 (Check for local chapter)
17. NATIONAL WILDLIFE FEDERATION, 1412-16th St., N.W., Washington, D.C. 20036 (Publishes Ranger Rick magazine)
18. NATURE CONSERVANCY (The), 156 2nd St., San Francisco, CA 94105 (415) 777-0541
19. OCEANIC SOCIETY, Fort Mason Center, San Francisco, CA 94123 (415) 441-5970
20. PENINSULA CONSERVATION CENTER, 2253 Park Blvd., Palo Alto, CA 94306
21. SAVE SAN FRANCISCO BAY, 2140 Shattuck Avenue, Berkeley, CA 94704 (415) 849-3053
22. SAVE THE REDWOODS LEAGUE, 114 Sansome St., San Francisco, CA 94104 (415) 362-2352
23. SIERRA CLUB (The), 530 Bush St., San Francisco, CA 94108 (415) 981-8634
24. SIERRA CLUB - Loma Prieta Chapter, 2253 Park Blvd., Palo Alto, CA 94306 (415) 327-8111
25. U. S. DEPARTMENT OF ENERGY, Office of Public Affairs, Washington, D.C. 20585

26. WHALE CENTER, 3929 Piedmont Avenue, Oakland, CA 94611 (415) 654-4892

27. WORLD WILDLIFE FUND, Dept. LAN, 1601 Connecticut Avenue N.W., Washington, D.C. 20009

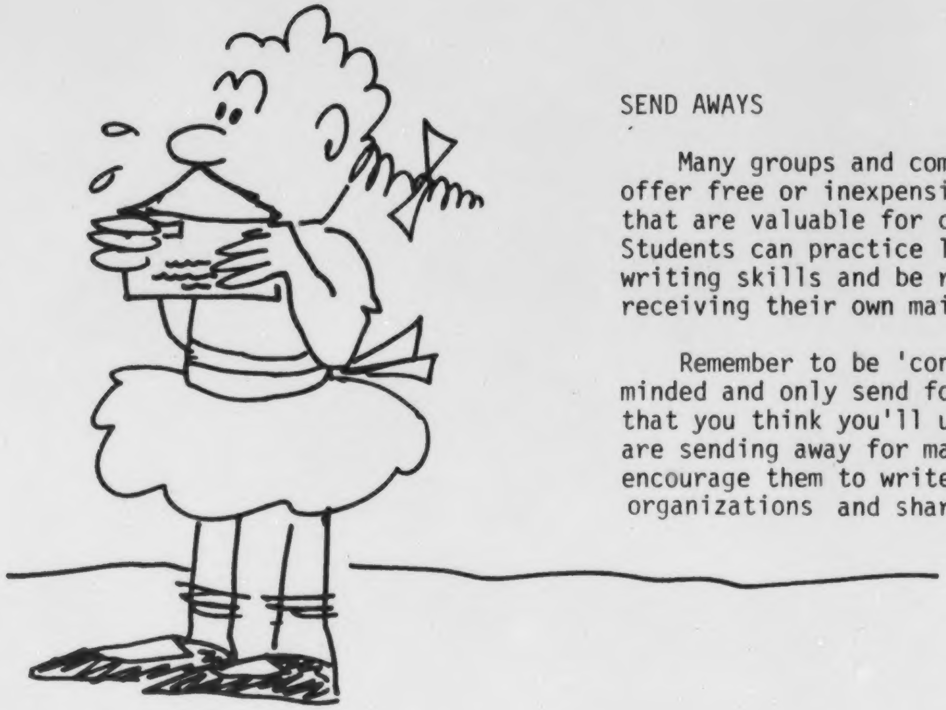
28. ZERO POPULATION GROWTH, P.O. Box 9393, San Jose, CA 95157

Also ...

The National Wildlife Federation publishes an extensive listing of government agencies and private organizations concerned with conservation. It is published annually and lists more than 1,400 organizations including the names, addresses, titles, and telephone numbers of current top officials and officers in each.

You can send for a listing called "Groups That Can Help; A Directory of Environmental Organizations" from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The cost for the pamphlet is 15¢.

Or write to Rudolph J. Schafer, Environmental Education Program Director, Calif. Department of Education, 721 Capitol Mall, Sacramento, CA 95814 (916) 322-4018 for additional help in locating conservation and energy education materials.



SEND AWAYS

Many groups and companies offer free or inexpensive materials that are valuable for classroom use. Students can practice language and writing skills and be rewarded by receiving their own mail.

Remember to be 'conservation' minded and only send for materials that you think you'll use. If students are sending away for materials, encourage them to write to different organizations and share their results.

1. Recycle - A set of forty art and education project worksheets compiled by the Resource Center of the Boston Children's Museum. All projects are made from 'throw aways'.

   Cost: $1.00 plus .30 for postage and handling.

   Send to: Children's Museum
   Jamaica Way
   Boston, Mass. 02130

2. Endangered Species Poster - A 28"x43" color poster listing 27 animals currently on the endangered list.

   Cost: $1.00

   Send to: Endangered Species Poster
   Crossman Arms Co.
   P.O. Box 355
   Newark, New York 14513

3. Doing Is Fun - A collection of activities to have fun with nature in each of the four seasons.

   Cost: 10¢ for postage and handling.

   Send to: Conservation Committee
   Garden Club of America
   598 Madison Ave.
   New York, New York 10022

4. Friends of the Earth Posters - Many 3x2 foot posters available. Send for listing. Proceeds go to conservation lobbying in Washington, D.C.

Cost: $2.50 per poster plus .25 handling charge.

Send to: Friends of the Earth
124 Spear St.
San Francisco, CA 94105

5. Don't You Dare Breathe That Air! - A booklet explaining the causes and effects of air pollution. Students draw their own illustrations.

Cost: Free

Send to: American Lung Association
GPO Box 596
New York, New York 10001

6. Energy and Kids - A Johnny Horizon information sheet on ways to save energy.

Cost: Free

Send to: Government Bookstore No. 15
U.S. Government Printing Office
P.O. Box 713
Pueblo, Colorado 81002

7. What We Get From Trees - A 20'x14' chart shows tree and different products that come from different parts.

Cost: Free

Send to: "What We Get From Trees"
Office of Distribution
Forest Service
U.S.D.A.
P.O. Box 2417
Washington, D.C. 20013

8. Nature Games - Eighty six nature games for ages 7 and up written by William Gould Vinal.

Cost: 25¢

Send to: American Humane Education Society
180 Longwood Ave.
Boston, Mass. 02115

9. Smokey Bear's Junior Forest Ranger Kit - A kit for young people which includes song sheet, photo, certificate and more.

Cost: Free

Send to: Smokey Bear's Junior Forest Rangers
Forest Service
U.S.D.A.
P.O. Box 2417
Washington, D.C. 20013

10. How You Can Make Paper - Step by step directions using inexpensive supplies found around the house.

Cost: Free

Send to: Things To Do At Home
American Paper Institute
260 Madison Ave.
New York, New York 10016

11. Michael Recycle - A comic book from Reynolds Aluminum Co. which tells the story of recycling aluminum.

Cost: Free

Send to: Recycling Public Relations Manager
Reynolds Metals Co.
Box 27003
Richmond, VA 23261

12. Ranger 'Rithmetic - Sets of math problems dealing with conservation topics. Sets available for 1st and 2nd grades, 3rd, 4th, and 5th. Specify which set you're requesting.

Cost: Free

Send to: Office of Information
Forest Service, U.S.D.A.
P.O. Box 2417
Washington, D.C. 20013

13. Somebody Do Something! - A Sierra Club notebook for students which is published six times a year. Includes stories, conservation projects, games and puzzles.

Cost: $1.00 for 6 issues.

Send to: Information Services
Sierra Club
530 Bush St.
San Francisco, CA 94108

14. Eco-News - An eight page monthly cartoon newsletter on environmental issues. It is published seven times a year and is suitable for 4, 5, and 6 grade students.

Cost: Approx. 35¢ per copy. Group rates are available.

Send to: Environmental Action Coalition
156 Fifth Ave. Suite 1130
New York, New York 10010

15. Mr. Peanut's Guide to Ecology - A 22 page booklet about spaceship earth.

Cost: Free

Send to: Standard Brands Educational Service
Box 2695 Grand Central Station
New York, New York 10017

16. Beautiful Junk - A listing of sources for free materials and what to make with it. Request No. 73-1036.

Cost: Free

Send to: U.S. Dept. of Health, Education and Welfare
Office of Child Development
Washington, D.C. 20201

17. Woodsy Owl Kit - A kit for young people containing dot to dot worksheet, decal, bookmark, photo of Woodsy and ideas for conservation.

Cost: Free

Send to: Woodsy Owl
Forest Service, U.S.D.A.
P.O. Box 2417
Washington, D.C. 20013

18. Earthbeats Newspaper No. 1 on Energy - A newspaper providing information on alternate fuel sources. Suitable for 5th or 6th grade students.

Cost: Free

Send to: Sea Grant College Program
University of Wisconsin
1800 University Ave.
Madison, WI 53706

19. The Story of Oil - A 25"x38" color fold out depicting the story of oil.

Cost: Free

Send to: Corporate Communications
Union Oil Co.
Box 7600
Los Angeles, CA 90051

20. Solar Science Projects - By D.S. Halacy, Jr. for students age 10 and up. Includes directions for making seven projects including solar cooker, water heater and radio.

Cost: 75¢

Send to: Scholastic Book Services
50 W. 44th St.
New York, New York 10036

21. Once There Lived a Wicked Dragon - A 30 page booklet which tells the story of our growing pollution problems. Suitable for grades 2 and above. Pictures to color throughout the story. Request by title and No. SW 105.1.

Cost: Free

Send to: Solid Waste Information Materials
Controls Section
U.S. Environmental Protection Agency
Cincinnati, Ohio 45268

842

22. Energy Activities with Energy Ant - A history of energy from dinosaur days to solar heated houses. Includes dot to dots, crossword puzzles and more.

Cost: Free

Send to: Federal Energy Administration
Office of Communications and Public Affairs
Washington, D.C. 20461

23. Environmental Bingo Game - A bingo game that teaches about the good and bad things in the environment.

Cost: 10¢ for postage and handling.

Send to: Conservation Committee
Garden Club of America
598 Madison Ave.
New York, New York 10022

24. You and Your Electric Company - A 30 page booklet with hundreds of facts about electricity. Suitable for 5th and 6th grade students.

Cost: Free

Send to: Edison Electric Institute
90 Park Ave.
New York, New York 10016

25. Birds, Flowers and Trees of the United States - A complete listing in alphabetical order.

Cost: Free

Send to: National Wildlife Federation
1412 - 16th St., N.W.
Washington, D.C. 20036

26. Solar Energy Booklist for Children and Teenagers - Lists many books about solar energy. Be sure to ask for the six information cards about solar heating, too.

Cost: Free

Send to: National Solar Heating and Cooling
Information Center
P.O. Box 1607
Rockville, Md. 20850

27. Story of the Environment and Industry - Information regarding minerals and the effect of mining such on our land. Suitable for 5th and 6th grade students.

Cost: Free

Send to: U.S. Steel Corporation
Room 727, 600 Grant St.
Pittsburgh, Pa 15230

28. Make Your Own Terrarium - A 2 page sheet telling how to put a terrarium together.

Cost: Free

Send to: Bookstore No. 15
U.S. Government Printing Office
P.O. Box 713
Pueblo, Colorado 81002

29. Fun With the Environment - A do-it workbook for students in grades 3-6. Begins with explanation of environment and introduces causes of pollution and what can be done to prevent it.

Cost: Free

Send to: U.S. Environmental Protection Agency
Office of Public Affairs (A-107)
Washington, D.C. 20460
or
Superintendent of Documents
U. S. Government Printing Office
Washington, D.C. 20402

30. Can Crafts - Ideas and crafts to make using old cans.

Cost: Free

Send to: Del Monte Can Crafts
Dept. 71067
Box 9009
Clinton, Indiana 52732

31. Puzzles About Smoking and Air Pollution - Puzzles for 4th grade students and above about smoking and air pollution.

Cost: Free

Send to: American Lung Association
1740 Broadway
New York, New York 10019

32. A Child's Garden - A booklet with many good ideas for gardening projects.

Cost: Free

Send to: Chevron Corporation, Public Affairs
575 Market St.
San Francisco, Ca 94105

33. Smokey Bear Costume - This costume is loaned for parades, Fire Prevention Week, etc. by the U.S. Forestry Service. They also have posters, color sheets, comic books, songs, placemats and other items. Request the costume at least two months in advance.

Cost: Free

Send to: U.S. Forestry Service, Cooperative Forest and Fire Division
630 Sansome St.
San Francisco, Ca (415) 556-8875

34. Animals and You: A Handbook of Animal Activities for People - A 14 page booklet of animal activities. Sections on pets, farm animals, zoo animals, and wildlife.

Cost: 25¢ for postage and handling.

Send to: American Humane Society
350 S. Huntington Ave.
Boston, Ma 02130

35. Our Redwood Heritage - Pamphlets and information about the redwood trees of California.

Cost: 15¢ for postage and handling.

Send to: Service Library, Dept. ORH
California Redwood Association
One Lombard St.
San Francisco, CA 94111

36. Panda Decal, Penguin Postcard and Animal Poster - The World Wildlife Fund will send you these materials along with information as to how you can help save endangered animals.

Cost: Free

Send to: World Wildlife Fund
Dept. LAN
1601 Connecticut Ave. N.W.
Washington, D.C. 20009

37. The Story of Geothermal Energy - A 25"x38" fold out showing how geothermal energy works.

Cost: Free

Send to: Corporate Communications
Union Oil Co.
Box 7600
Los Angeles, CA 90051

38. The Little Seed that Grew and Grew - A 20"x23" double poster shows parts of avocado plant and instructions on how to grow it.

Cost: Free

Send to: Avocado Information
Box 2162
Costa Mesa, CA 92626

39. 71 Things You Can Do to Stop Pollution - A checklist of things to do to stop litter and other types of pollution.

Cost: Free

Send to: Keep America Beautiful, Inc.
99 Park Avenue
New York, New York 10016

40. How to Recycle Everyday Materials from the Home - Lots of ideas on ways to recycle paper, aluminum, glass and other materials found around the house.

Cost: Free

Send to: National Wildlife Federation
1412 16th Stree, N.W.
Washington, D.C. 20036

41. The Litter Fact Book - A book with many ideas on how to break the 'litter habit'.

Cost: Free

Send to: Public Affairs Department
Glass Container Manufacturers Institute, Inc.
330 Madison Avenue
New York, NY 10017

42.

43.

44.

45.

FIELD TRIPS

MUSEUMS

1. LOS GATOS MUSEUM

   A small museum displaying minerals, fossils and artifacts from the area. There is also a living beehive observable from three sides through glass panes.

   Where: Los Gatos, California
   Tait and Main Streets (408) 354-2646
   When: Daily, 1-4
   AM tours by appointment
   Free

2. PALO ALTO JUNIOR MUSEUM AND ZOO

   A children's museum with exhibits that change frequently. Various animals native to the area are part of the zoo.

   Where: Palo Alto, California
   Rinconada Park, 1451 Middlefield Road (415) 329-2111
   When: Tuesday through Friday, 10-12, 1-5
   Free

3. COYOTE POINT MUSEUM

   Displays and exhibits provide information regarding the natural history of the San Mateo area.

   Where: San Mateo, California
   Coyote Point Park, (415) 573-2595
   When: Tuesday through Friday, 9-6
   Museum is free. $2 charge per car for park use. Picnic area available.

MUSEUMS

4. YOUTH SCIENTIFIC INSTITUTE

A small zoo and museum with exhibits that students can touch.

Where: San Jose, California
Alum Rock Park (408) 258-4322
When: Tuesday through Friday, 9-4:30
Adults 25¢, children 10¢

5. JOSEPHINE D. RANDALL JUNIOR MUSEUM

A junior museum/zoo especially designed for children. A seismograph, mineral and electricity exhibits are available as well as contact with many types of animals.

Where: San Francisco, California
199 Museum Way at Roosevelt (415) 863-1399
When: Tuesday through Saturday, 10-5
Free

EXHIBITS

1. LAWRENCE HALL OF SCIENCE

A large museum with many science exhibits. Displays offer opportunities for students to touch and participate in learning.

Where: Berkeley, California
Canyon Road, North and Grizzly Peak Boulevard, (415) 642-5132
When: Monday through Friday, 10-4:30
Adults $1.75, students 75¢
Special programs can be arranged for classes. This is an all day trip and well worthwhile.

2. THE EXPLORATORIUM

A 'hands on, touch me' experience for students. Children are encouraged to participate in various science exhibits and learn by doing. The exhibits change frequently.

Where: San Francisco, California
Palace of Fine Arts, Lyon Street (415) 563-7337
When: Wednesday through Sunday, 1-5
Free, donations are requested
Groups by appointment

3. ENERGY EXPO

Multi-media show explains nuclear power, exploring energy sources, undersea ecology, and solar energy. Many 'hands on' experiences for students.

Where: San Francisco
Pacific Gas and Electric Company
77 Beale Street (415) 781-4211
When: Monday through Friday, 9-4:30
Call for appointment
Free

EXHIBITS

4. A WORLD OF OIL/CHEVRON USA

Multi-media program; films, photographs, models and dioramas depicting the story of oil. Includes discovery, refining, and present day uses of oil.

Where: San Francisco
555 Market Street (415) 894-4895
When: Monday through Friday, 9-4
Call for appointment
Free

5. CALIFORNIA DIVISION OF MINES AND GEOLOGY MINERAL EXHIBIT

Large exhibit or rocks and minerals. Includes a working model of a quartz mill and display cases of minerals from every county in the state.

Where: San Francisco
Ferry Building, foot of Market Street, Room 2022 (415) 557-0633
When: Monday through Friday, 8-4:30
Free

6. SAN FRANCISCO BAY - DELTA MODEL

A hydraulic scale model of San Francisco Bay and the Sacramento-San Joaquin Delta built by the U.S. Army Corps of Engineers. The model shows tidal action, mixing of fresh and sea water and is used to study ecological problems of the area. Guided tours take 1½ hours and include a history of the San Francisco Bay region.

Where: Sausalito, California
2100 Bridgeway (415) 332-2871
When: Monday through Friday, 9-4
Call for appointment. Be sure to ask if model is in operation.
Free

NATURE AREAS

1. BIG BASIN REDWOODS STATE PARK

A State Park containing over 11,000 acres and many miles of hiking trails. A museum contains exhibits regarding the ecology of the area with special emphasis on the redwoods.

Where: North of Santa Cruz, west of Highway 9.
When: Open all year
Call for Ranger services for classroom trips. Special hikes, trail restoration and other projects can be arranged.
Picnic area is available.

2. HENRY COWELL REDWOODS STATE PARK

A 1700 acre park with hiking trails and self guided tours. Huge redwood trees, including the General Grant tree.

Where: Highway 9, north of Santa Cruz (408) 835-4598
When: Daily

3. POINT LOBOS STATE RESERVE

An outdoor museum of marine life. All plants are identified and the entire area is protected by law. Many nature trails.

Where: Rt. 1, south of Carmel (408) 624-49409
When: Daily, 9-4
Call and check for availability. Very popular place for field trips.

4. PINNACLES NATIONAL MONUMENT

A 14,000 acre park comprised of unusual rock formations, caves and the pinnacles. Many hiking trails.

Where: Off highway 101 at King City (408) 389-4578
When: Daily
Parking fee $1.50 per car

5. VILLA MONTALVO

Nature area includes redwood grove, trails, arboretum and bird sanctuary.

Where: Saratoga, California
Saratoga-Los Gatos Road, (408) 867-3421
When: Daily, 8-5
No charge for nature area, admission fee to art gallery.

6. AUDUBON CANYON RANCH

A 1,000 acre wildlife sanctuary. Opportunities to see birds, animals and plant life in their natural habitat. A display hall shows local plants and animals and information regarding the San Andreas Fault.

Where: Highway 1, three miles north of Stinson Beach (415) 383-1644
When: March 1 through end of school year, 10-4
Call for appointment as early as possible. Fills up fast.
Grades 4,5 and 6 only.
Free
Picnic area is available

7. MUIR WOODS NATIONAL MONUMENT

A forest of giant Coast redwood trees. Self guiding nature trails provide information about the forest.

Where: Off Highway 1, on Muir Woods Road, (415) 388-2595
When: Daily, 8 to sunset
Free
Bag lunches or picnics are not allowed.

NATURE AREAS

8. POINT REYES NATIONAL SEASHORE

Sealife and beach habitat. Many nature trails. Point Reyes Lighthouse is now open to the public. There is also a Miwok Indian Village in a new part of the Park. Tomales Bay State Park, adjoining, offers tidepool activities.

Where: Highway 1, Olema
(415) 663-1092
When: Daily, 8 to sunset
Point Reyes is free.
Tomales Bay State Park charges for parking. Call for reservations early as this is also a very popular field trip area.

ENVIRONMENTAL CENTERS

1. HIDDEN VILLA RANCH

A working farm offering tours and activities for elementary school children. An environmental project provides one to four day programs for students in grades 1-6.

Where: Los Altos Hills, California
26870 Moody Rd. (415) 948-4690
When: By appointment

2. ENVIRONMENTAL STUDIES AREA

A new part of the DeAnza College campus which offers a variety of biological environments found in California. Models demonstrate the ecology of different communities including plant and animal life. Special programs can be arranged for classes.

Where: Cupertino, California
DeAnza College
21250 Stevens Creek Boulevard and Stelling Road, (408) 257-5550 ex. 225
When: By appointment for classroom trips and 1st Saturday of each month, 12-4
Call for scheduled offerings.

3. MARINE ECOLOGICAL INSTITUTE

An 85 foot research ship offers tours and classes regarding the ecology of the San Francisco Bay and Delta regions. Half day, day and five day cruises as well as shore field trips are available.

Where: Redwood City, California
811 Harbor Boulevard (415) 364-2760
When: By appointment
Grades 4, 5 and 6

4. BAYLANDS NATURE INTERPRETIVE CENTER

A nature center emphasizing salt marsh ecology. Nature walks, workshops and exhibits.

Where: Palo Alto, California
2775 Embarcadero Road (415) 329-2506
When: Wednesday through Friday, 2-5
Call for appointment
Free

ENVIRONMENTAL CENTERS

5. REFUGE HEADQUARTERS INTERPRETIVE CENTER

Environmental programs, nature study walks, slide and film programs provide instruction concerning the baylands and salt marsh habitats. Special class programs can be arranged.

Where: Fremont, California
Highway 84, near Dumbarton Bridge Toll Plaza, (415) 792-3178
When: Wednesday through Sunday, 10-5
Call for appointment

6. ENVIRONMENTAL EDUCATION CENTER: SAN FRANCISCO BAY NATIONAL WILDLIFE REFUGE

An educational center operated under the National Fish and Wildlife Service. Instruction, tours, laboratory experiences and more are offered for elementary school students. Teacher or group leader must attend orientation session prior to class field trip.

Where: Alviso, California (408) 262-5513
When: Tuesday through Friday, 9-3
Classroom programs by appointment.
Free

7. DEER HOLLOW FARM

This farm is part of Rancho San Antonio, Mid Peninsula Region Open Space. A variety of two hour tours include instruction for students regarding farming, plant and animal life, gardening, nature walks and general ecology of the area.

Where: Los Altos Hills, California
7550 St. Josephs Ave. (415) 968-0364
When: School programs are usually offered Mondays, Wednesdays and Thursdays. The farm is open to the public daily from dawn to dusk. Reservations for classrooms are made through the Mountain View Park and Recreation Dept., (415) 966-6331 after October 1st. This is a very popular place for field trips and fills up quickly. Call early. There is a $20 fee per classroom. Grades K through senior citizens.

(There are other Mid Peninsula Regional Open Space areas available for nature hikes. The Environmental Volunteers are an excellent source of information on which areas are appropriate for classroom groups and can often provide trained people to assist classroom teachers regarding the ecology of the area. They are located in Palo Alto, 2253 Park Boulevard, (415) 327-6017.)

SPECIAL AREAS OF INTEREST

1. INTEGRAL URBAN HOUSE OF THE FARALLONES INSTITUTE

A city house demonstrating environmental strategies and techniques for food production, energy conservation, waste recycling and pest management.

Where: Berkeley, California
1516 Fifth Street (415) 525-1150
When: Self guided tours Tuesdays through Fridays 10-3, Saturdays 1-5
Guided tours by appointment
Upper grade students suggested
$1.00 admission charge

852

SPECIAL AREAS OF INTEREST

2. MINOLTA PLANETARIUM

Special programs planned for elementary students dealing with astronomy.

Where: Cupertino, California
DeAnza College
21250 Stevens Creek Boulevard and Stelling Road
When: Call for schedule.
(408) 994-4814 between the hours of 9:00 and 1:00 Mondays, Wednesdays and Friday only.
Charge of 50¢ per student for educational school programs.

3. JOHN MUIR NATIONAL HISTORIC SITE

John Muir's nineteenth century farmhouse exhibiting many of his personal belongings. Film shows natural wonders that inspired Muir's life.

Where: Martinez, California
4202 Alhambra Ave. (415) 228-8860
When: Tours take place daily, on the hour 8:30-4:30
Call for reservations for classroom groups.

4. OLD FAITHFUL GEYSER OF CALIFORNIA

One of three faithful geysers in the world. Erupts every 40 minutes. A tape recording tells history of the area and how geysers are formed.

Where: Calistoga, California
1299 Tubbs Lane
When: Daily, weather permitting, 9 till sunset
Adults $1, under 12 50¢
Picnic area available

5. THE PETRIFIED FOREST

A forest of petrified redwoods. Nature trails and gift shop which includes samples of petrified wood, insects and fossils.

Where: Between Calistoga and Santa Rosa
Petrified Forest Road
When: Daily 9-5
Admission charge, over 10 $2.00

6. BLACK DIAMOND MINE REGIONAL PRESERVE

A tour through a coal mine to learn about coal mining and area history.

Where: Antioch, California
Highway 4 to Somersville Road, keep south to road's end.
(415) 757-2620
When: Weekends, 9:30-12, 1:30-3
Call for reservations
Admission charge, adults $1.00 child 50¢

OLD FAITHFUL
PETRIFIED FOREST
MINES

TOURS

1. LESLIE SALT COMPANY
   Tour includes the total production process of salt. Film and plant tour.

   Where: Newark, California
   7220 Central Ave. (415) 797-1820
   When: Tuesday, Wednesday, Thursday by appointment, 10:30-3:30
   Students must be over 8 years old.
   Free

2. RICONADA WATER TREATMENT PLANT
   A division of the Santa Clara Valley Water District. This plant treats area water from the Delta. Tours explain control of water flow and introduction to laboratory processes. Approximately 45 minutes.

   Where: Los Gatos, California
   400 More Ave. (408) 395-8121
   When: Tuesday through Friday, 9-3
   Call for appointment
   Free
   Park nearby available for picnic lunches.

3. PALO ALTO WATER QUALITY CONTROL PLANT
   Plant offers one hour tours of its secondary sewage treatment process.

   Where: Palo Alto, California
   2501 Embarcadero Way (415) 329-2243
   When: Thursdays
   Call for appointment
   Grades 4,5 and 6
   Free

4. REYNOLDS ALUMINUM RECYCLING CENTER
   Tours available to see entire recycling operation for aluminum products.

   Where: Hayward, California
   20671 Corsair Ave. (415) 785-9565
   When: Tuesday through Saturday
   Call for appointment
   Grades 1-6
   Free

5. BEN LOMOND NURSERY
   A local nursery which specializes in growing redwoods from seedlings. These trees are used for planting projects within the state. Students are welcome to visit.

   Where: Ben Lomond, California
   13665 Empire Grade, Bonny Doon Route, Santa Cruz (408) 423-6551
   When: Call or write for an appointment.

MORE PLACES TO GO, PEOPLE TO SEE ...

1. VENTURE WEST

This a a private non-profit group offering outdoor programs for students in grades 2 - 12, but especially suitable for grades 4,5 and 6. Most common are their three day, two night field trips but trips can be arranged from one to seven days in duration. They provide programs dealing with Bay Area Studies, Native Americans, 49er Goldrush Historical Life and can tailor programs to fit your class needs. Trips include food, supplies, trained naturalists and cost approximately $16 per day per student plus transportation.

Call for further information.

Venture West
P.O.Box 13207 Station E
Oakland, CA 94661 (415) 531-3422

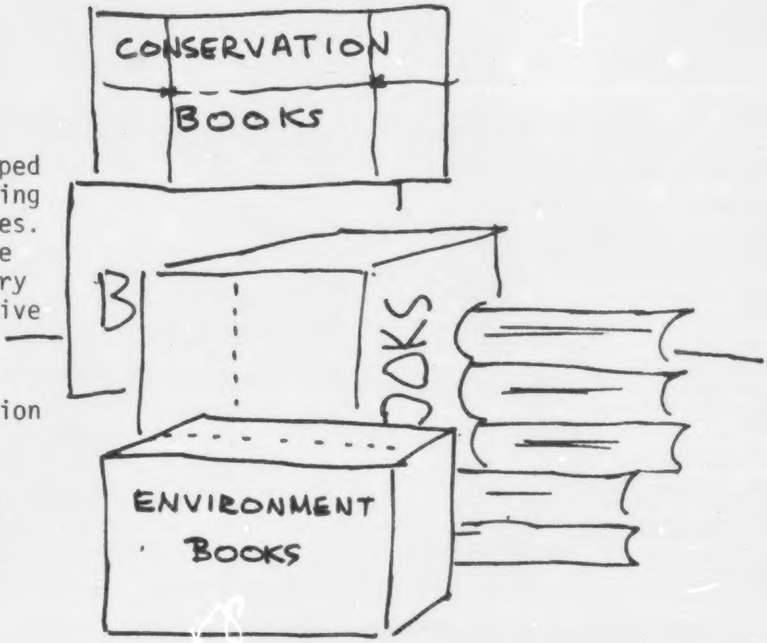
2.

Other PROGRAMS AND MATERIALS

Many programs have been developed to promote awareness and understanding of ecological concepts and principles.
We have included those that are practical and relevant for elementary school students. For a more extensive listing, write to:

The Harbinger File
Peninsula Conservation Foundation
50 Rustic Lane
Santa Cruz, CA 95060

The cost for the directory is $6.50 which includes tax and handling.



1. HUMANISTIC ENVIRONMENTAL EDUCATION (Green Box)

A complete curriculum (K-8) emphasizing mental/physical activities, conceptualization and transfer, and synthesis and communication of environmental concepts. The curriculum is packaged in a kit - THE GREEN BOX - which contains 178 activity cards as well as teacher manual and additional teaching activities and outdoor experiences.

Available from: Project Director
Office of Environmental Education
Humboldt County Schools
555 H. Street P.O. Box 1408
Eureka, CA 95501 (707) 445-5411 Ext. 265

Teacher training and inservice is available

Cost: $40 for kit. (CUSD teachers may obtain this through IMC)

2. THE EVERYTHING INCLUDING THE KITCHEN SINK GUIDE TO ENVIRONMENTAL EDUCATION

Sixty two lesson plans cover eight areas of interest; environmental concepts, plants, insects, reptiles, birds, Indian culture, art in nature, and survival. The 133 page guide also contains featured articles, special activities and crafts, places to go, cartoons and illustrations, film and book reviews, games and puzzles.
Appropriate for grades K - 8.

Available from: Office of Santa Clara County Superintendent of Schools
Publications Department
100 Skyport Drive
San Jose, CA 95110

Cost $8.00 per guide.

3. PROJECT LEARNING TREE (PLT)

An activity guide for grades K through 6 which offers an interdisciplinary program and classroom activities. Each lesson includes concepts, skills, objectives, activities, variations and extensions.

Sponsored by the Western Regional Environmental Council and the American Forest Institute. A supplementary guide for grades 7 - 12 is also available.

Available from: P.O. Box 129
Tiburon, CA 94920 (707) 545-9531

Materials are only available to participants in full day PLT workshops.

4. MANURE TO MEADOW TO MILKSHAKE

A comprehensive program of teaching strategies from the Hidden Villa Environmental Project. The teachers guide, written by Eric Jorgensen, Trout Black, and Mary Hallesy contains 130 pages of classroom ideas and lessons for students. All lessons include concepts, insight, preparation, and action for students and are adaptable for 1 - 6 grade classes.

Available from: Hidden Villa, Inc.
26870 Moody Road
Los Altos Hills, CA 94022

Cost: $6.25 includes tax and postage.

5. THE TRASH MONSTER

A multi-media program for 5th and 6th grade students. The materials include a sound filmstrip, resource cards, pupil booklets, pre and post tests, stickers and home information leaflets. Helps students decide what to do about our growing mountains of trash.

Available from: California State Solid Waste Management Board
1020 9th St. Suite 300
Sacramento, CA 95814

Cost: Free.

6. THE WIZARD OF WASTE

A multi-media program for 2nd, 3rd, and 4th grade students providing information on litter, garbage and other waste materials. Materials include a sound filmstrip, poster, cards, student booklets, pre and post tests, self-surveys, badges, home information leaflets, and litter bags.

Available from: California State Solid Waste Management Board
1020 9th St. Suite 300
Sacramento, CA 95814

Cost: Free.

7. ECOLOGY HAPPENINGS

An environmental education program developed under ESEA Title IV-C. Includes three conservation guides for teachers.

1 - Environmental Skills and Conservation Projects
2 - Environmental Activities - That Can be Done In or Near the Classroom
3 - Ecology and Outdoor Science

The guides are designed for 3rd through 8th grade students, including special education classes.

Available from: Fred Thompson
La Mesa - Spring Valley School District
4750 Date Ave.
La Mesa, CA 92041

Cost: $5.00 for the set.

8. WHERE HAVE ALL THE WILD THINGS GONE?

This is a slide tape program that discusses the plight of the Earth's wildlife. A teachers' packet is available that provides much information regarding endangered animals.

Available from: Woodland Park Zoological Gardens
Education Department
5500 Phinney Ave. North
Seattle, Washington 98103 (206) 625-4550

Cost: Teachers' packet is $2.00.

9. ECOLOGY ACTIVITY CARDS (written by John Lord)

A boxed set of activity cards suitable for 5th and 6th grade students. Cards provide information and ideas on ecological principles, niches, populations, energy, urban ecology and general conservation.

Available from: BFA Educational Media
211 Michigan Ave.
Santa Monica, CA 90404

Cost: Write for current price.

10. EEE (ENERGY, ENVIRONMENT AND THE ECONOMY)

Interdisciplinary units of materials for students and teachers.

Grade 1 - The Energy We Use
Grade 2 - Community Workers and the Energy They Use
Grade 3 - Energy and Transportation

Available from: Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Cost: Printed copy, $6.00.
Microfiche, $3.00.

11. ENVIRONMENTAL EDUCATION ACTIVITIES MANUALS

Six teachers' manuals provide a complete program for students from primary to senior high school. Manuals include:

- Volume 1 - Concerning Spaceship Earth
- Volume 2 - Lower Elementary Activities
- Volume 3 - Middle Elementary Activities
- Volume 4 - Upper Elementary Activities
- Volume 5 - Junior High Activities
- Volume 6 - Senior High Activities

The manuals were edited by William B. Stapp and Dorothy A. Cox and include many values clarification activities.

Available from: William B. Stapp and Dorothy A. Cox
30808 LaMar
Farmington Hills, Michigan 48024

Cost: Approximately $10 per manual.

12. WATER PLAY AND CAPTAIN HYDRO

Student booklets and teacher's guide written by Bob Johnson and Phil Frank. A fun book for students which includes puzzles, stories, and lots of things to do to motivate students and provide knowledge relating to the conservation of water. Spanish version is also available.

Available from: Santa Clara Co. Office of Education
100 Skyport Drive
San Jose, CA 95110

Cost: Free. Distributed by Santa Clara Valley Water District

13. AUNT ENERGINA and the ADVENTURES OF AUNT ENERGINA (full name is Energina Wattensockett)

Student booklets and teacher's quide written by Bob Johnson, Phil Frank, and Paul Fletcher. Puzzles, lessons, and fun things to do to teach students about energy.

Available from: Innovative Publications
1885 Oak Park Blvd. Suite C
Pleasant Hill, CA 94523 (415) 944-0923

(May be distributed by P.G.&E. after 1/81)

Cost: Depends on quantity ordered.

14. ENERGY IS WHERE YOU FIND IT

Multi media materials produced by Atlantic Richfield Co. Boxed materials include two sound filmstrips, duplicating masters, charts, and student tests.

Available from: Atlantic Richfield Co. Public Affairs Division
515 South Flower St.
Los Angeles, CA 90071

Cost: Free

15. ENERGY AND YOUR FUTURE ENVIRONMENT

Multi media materials produced by Chevron suitable for use in grades 5 and 6. Boxed materials include two sound filmstrips, ten duplicating worksheets, wall charts, game, transparencies, teacher's guide, pre and post tests, and objectives.

Available from: The Chevron Companies
Visual Materials Inc.,
Redwood City, CA

Cost: Free.

16. YOU AND RECYCLING

Four sound filmstrips and guides, suitable for 2nd through 6th grades.
Titles include: Water All Around Us
Kiwi and the Bottle
Trash Treasure Hunt
The Magician

Available from: Society for Visual Education, Inc.
1345 Diversey Parkway
Chicago, Illinois 60614

Cost: Write for current prices and catalog of other filmstrips.

17. AMERICA'S URBAN CRISIS - Group 1

Six sound filmstrips and guide, suitable for upper elementary students.
Titles include: Air Pollution Menace
Transportation Crisis
Housing Crisis
Water Pollution

Available from: Society for Visual Education, Inc.
1345 Diversey Parkway
Chicago, Illinois 60614

Cost: Write for current prices and catalog of other filmstrips.

18. CHILD ECOLOGY

A complete resource guide for the elementary school teacher. Includes ecology units for grades K through 6. Includes ecological concepts such as environments, habitats, the bay and marsh, the seashore, the forest, and man's impact on the environment.

A National Grant Project of the Los Altos Branch of The American Assoc. of University Women in 1974. Edited by Ann Smith.

Available from: Child Ecology Press
Los Altos, CA 94022

or try local libraries. Library of Cong. No. 73-92596

19. ETC! ENVIRONMENTAL TASK CARDS

Student task cards divided into four areas; Awareness, Soil, In the Outdoors, and Man's Impact. Activities are teacher directed for grades K - 3, self directing for upper grade students. Workshops are available.

Available from: Jean Wobbe
P.O. Box 1749
Redding, CA 96001 (916) 241-7132

Cost: $40 plus tax and postage.

20. ANIMAL EDUCATION CATALOG

Includes resources for films, literature and lesson plans to teach students about animals with an emphasis on animal welfare. Classroom programs are also available.

Available from: The Fund for Animals
Fort Mason Center, Bldg. B
San Francisco, CA 94123 (415) 474-4020

Cost: Contributions welcome. Return postage for films.

21. SPACESHIP SCHOOL, Marin County Office of Education

An environmental curriculum employing the "Spaceship Earth" concept of limited resources and the need for care to maintain our planet. Packets of activities for K-3 and 4-6. No special equipment needed. Activities include math, language arts, social studies, art and science.

Available from: Marin Teacher Learning Cooperative
111 Las Galinas Ave.
San Rafael, CA 94903 (415) 663-8247

Cost: Available upon request. Write Barbara Steinberg at the above address.

ADVENTURES
IN
CO VATION

FILMS

The following fims are available to teachers through the Educational Media Center, Office of the Santa Clara County Superintendent of Schools. Please refer to their catalog for detailed descriptions of the films.

Co. AV call no.	Title	Length	Grade Level*	Conservation for Children concept
3344	Adaptations of Plants and Animals	10	3 (4) 5	Adaptation
0652	Adventures of Jr. Raindrop	8	1 2 (3)	Water cycle
3247	Adventuring in Conservation	14	4 5 6	Conservation
7309	Africa's Vanishing Wildlife	15	(4)(5) 6	Endangered animals
4193	Air Pollution	11	(4)(5)(6)	Pollution
8030	American Bald Eagle	16	(4)(5) 6	Endangered animals
4280	Animal Predators and the Balance of Nature	10	3 (4) 5	Balance of Nature
6434	Bay Tidelands	14	2 3 (4)	San Francisco Bay

* Grade level in parentheses indicates specific concept of grade level guide.

** Films suggested for junior and high school students. These films should be previewed for appropriateness.

Co. AV call no.	Title	Length	Grade Level	Conservation for Children concept
0588	Birds in Your Backyard	11	1 (2) 3	Habitats
0873	Blow Wind, Blow!	11	1 2 (3)	Wind, energy
0203	Boxes (At your Fingertips)	10	1 (2) 3	Recycling
8315	Boy Who Liked Deer	18	1 - 6	Care of Environment
0186	Buttercup	11	1 - 6	Pollution
1628	Chaparral - The Elfin Forest	10	(4) 5 6	Man's effect on environment
5039	Chaparral, Grassland, & Fresh Water Pond	16	1 (2) 3	Habitats
4028	Clouds	10	1 2 (3)	Water cycle
7564	Conquest of Giants (Redwoods)	26	(4) 5 6	Natural resources
4234	Conservation for Beginners	11	(1)(2)(3)	Natural resources
7763	Conservation: To Save Our Environment	13	(5)(6)	Conservation
2565	Conserving Our Forests Today	11	4 5 6	Conservation
2558	Conserving Our Soil Today	11	1 - 6	Conservation
4020	Conserving Our Water Resources Today	11	4 5 6	Conservation
7695	Cry of the Marsh	12	(4) 5 6	Man's effect on environment
7726	Dam Builders (Ecology of the Beaver and Man)	30	5 6**	Man's effect on environment
2293	Desert	10	(4) 5 6	Adaptation
2559	Earth: Resources in its Crust	11	4 (5) 6	Energy sources
3823	Ecology Primer	22	(4)(5)(6)	Endangered animals Pollution, populat
8533	Earth - Planet, Universe John Muir	29	4 5 6	Conservation
6468	Endless Search	24	(5)(6)	Edison and energy
2496	Energy from the Sun	11	(6)**	Solar energy
7965	Energy: Less is More	18	(6)**	Conservation
7883	Energy: New Sources	20	(6)**	Energy sources
7882	Energy: The Dilemma	20	(6)**	Supply and demand
7884	Energy: The Nuclear Alternative	20	(6)**	Nuclear energy

Co. AV call no.	Title	Length	Grade Level	Conservation for Children concept
6468	Endless Search	24	(5)(6)	Energy sources
6121	Energy Challenge	25	(5)(6)	Energy
6156	Energy: Choices, Options, Decisions	14	5 (6)	Energy alternatives
6047	Energy: 2000	22	5 (6)	Energy sources
8555	Energy: A National Issue	27	4 5 (6)	Energy
8657	Energy Monsters: How to Starve Them	12	1 - 6	Conservation
8019	Farallon Light	25	(4) 5 6**	Wildlife refuge
6403	Energy	11	4 5 6	Energy
4248	Flower and the Ladybugs	11	1 - 6	Value of insects
4030	Food: Energy from the Sun	10	1 (2) 3	Food chain
1824	Forestry	20	(4) 5 6	Natural resources
7194	Fresh Water Pond	13	1 (2) 3	Habitats
6433	From Redwoods to Beaches	15	1 2 3	Environments
4033	From Seeds to Plants	10	(1) 2 3	Basic needs
1108	Future Shock	42	Adults	Awareness
4196	Garbage	11	(4) 5 6	Waste
0905	Geysers and Hot Springs	11	(4) 5 6	Geothermal energy
1172	Great Search: Man's Need for Power and Energy	13	(4)(5)(6)	Energy sources
6281	Harvest of Water	15	(3) - 6	Water
8205	Home	30	6**	Pollution
4214	House Ahead	11	1 2 (3)	Man's effect on environment
7119	House of Man - Our Changing Environment	17	(6)**	Alternatives
4202	House of Man - Our Crowded Environment	11	4 5 (6)	Population
2973	How Air Helps Us	11	1 - 6	Value of air
0999	How Plants Help Us	11	(1)(2) 3	Plants
2770	How Trees Help Us	11	(1)(2)-6	Trees
8539	Humpback Whale: Winter, a Time for Singing	21	(4) 5 6	Endangered animals
8374	Inside Out: You Belong	15	4 5 6	Responsibility for environment

Co. AV call no.	Title	Length	Grade Level	Conservation for Children concept
0348	Is This Our Father's World	9	4 5 (6)**	Pollution
8057	It's Your Air (Air Pollution)	23	(4)(5)(6)**	Bay area pollution
7867	John Muir	15	3 - 6	John Muir
7711	Lakes: Aging and Pollution	15	2 - 6	Pollution
8314	Last Days of the Dolphins	28	(4)(5) 6**	Endangered animals
8464	Learning About Water	10	1 - 6	Water cycle
4250	Life in a Vacant Lot	10	1 (2) 3	Interdependency
2081	Life in the Desert	11	(1)(2) 3	Habitats
3714	Life in the Ocean	16	(1)(2) 3	Habitats
0190	Litter, Litter, Everywhere	8	(1)(2)(3)	Pollution
2428	Litterbug	10	(1)(2)(3)	Pollution
0204	Lonely Scarecrow	11	1 2 3	Ecology
8304	Looking for Organic America	28	(5) 6**	Organic farming
8075	Lorax	26	1 - 6	Pollution
7730	Man's Basic Needs: Natural Resources	11	3 - 6	Natural resources
2809	Marshlands	11	2 (3)(4)	Marshlands
8175	Meadow - An Ecosystem	13	(4) 5 6	Ecology
8178	Meecology	26	(4)(5)(6)	Conservation
7567	Men at Bay (San Francisco Bay)	25	(4) 5 6	Bay area pollution
7847	Nature Has an Answer	16	(5) 6**	Pest control
1408	Nature's Half Acre	33	3 - 6	Ecology
3244	Nature's Plan (Water)	15	(3) - 6	Water cycle
7808	Nineteen Eighty Five	56	Adults	Predictions
0132	Ocean: A First Film	11	1 - 6	Water
7796	Of Broccoli and Pelicans and Celery and Seals	30	(5) 6**	Pesticides
0875	One Rainy Day	11	1 2 3	Water value
0192	Organic Gardening: Composting	11	4 (5) 6	Organic gardening
8085	Otters, Clowns of the Sea	14	2 (3)(4)	Endangered animals
7590	Our Endangerd Environment: Soil	17	1 - 6	Soil conservation
7833	Our Mr. Sun (2 parts)	60	5 (6)**	Solar energy
7849	Poisoned Sea	27	5 (6)**	Pollution

Co. AV call no.	Title	Length	Grade Level	Conservation for Children concept
5070	Pollution	15	6**	Pollution
8124	Pollution is a Matter of Choice	53	6**	Pollution
7709	Pollution: Air, Land, Water, Noise	17	4 (5) 6	Pollution
8499	Power Without End	16	4 (5)(6)	Energy sources
6099	Plastics from Petroleum	20	4 (5) 6	Petroleum use
4258	Rain	8	1 - 6	Water cycle
3909	Rainshower	15	1 - 6	Value of rain
3163	Redwood Trees	15	(4) 5 6	Natural resources
6445	Resource Recovery (Garbage)	13	4 (5) 6	Energy source
6386	River Must Live	21	4 5 6	Water pollution
3712	Science Conserves the Forest	15	4 5 6	Forest rangers
7774	Sea Otter	17	(4) 5 6	Endangered animals
4297	Seacoasts: A First Film	10	1 (2) 3	Ecology
8503	Say Goodbye	50	Adults	Endangered animals
4008	Soil - What It Is and What It Does	11	1 2 3	Soil use
8340	Solar Energy: To Capture Power of Sun and Tide	21	6**	Solar energy
3734	Thomas Edison	26	(5) 6**	Inventors
0282	Thousand Suns	9	5 (6)**	Conservation
8633	Thin Edge of the Bay	22	(4) 5 6	San Francisco Bay
4286	The Tree	11	1 (2) 3	Tree products
4186	Treehouse	9	(4)(5)(6)	Conservation
7299	Trees and Their Importance	12	(4) 5 6	Natural resources
2541	Turn a Handle, Flick a Switch	11	1 2 3	Energy sources
6117	To Keep America Beautiful	6	4 5 6	Conservation
3160	Urban Sprawl	15	(4) 5 6	Land Use
7456	Urban Uses of Land in Northern California	18	(4) 5 6	Land Use
1234	Watch Out For My Plant	13	2 3 4	Conservation
6008	Water Follies: A Soak Opera	7	1 - 6	Conservation
4042	Water for All Living Things	9	4 5 6	Water use
4045	We Get Food From Plants and Animals	11	(1)(2) 3	Food sources
0287	What Do Plants Do: A First Film	11	(1)(2) 3	Plant values
7712	What Ecologists Do	15	(4) 5 6	Ecology

Co. AV call no.	Title	Length	Grade Level	Conservation for Children concept
2048	What is Soil?	12	1 - 6	Soil
2500	What Plants Need for Growth	11	(1)(2) 3	Plant needs
4031	What's Alive?	10	1 - 6	Living things
8500	White Seal, the	26	1 - 6	Endangered animals
2039	Winds and their Causes	11	4 5 6	Energy sources
2177	Your Friend the Forest	6	1 - 6	Forest fires
2178	Your Friend the Soil	7	1 - 6	Soil value

Other Film Sources:

Public Libraries - Many public libraries have films for loan. You will need a library card.

The Latham Foundation - Free loan and low cost rental films are available. Send for their current listing.

The Latham Foundation, Film Distribution Center
Latham Plaza Building
Clement and Schiller
Alameda, CA 94501 (415) 521-0920

Modern Talking Picture Service - Free loan. You pay postage for shipping and handling. Write to:

Modern Talking Picture Service
149 New Montgomery St. Fourth Floor
San Francisco, CA 94105 (415) 543-4075

Association Sterling Films - Audio-visual distributors for many companies/agencies.
Dublin, California Exchange
6644 Sierra Lane
Dublin, CA 94566 (415) 829-2300

CHILDREN'S BOOKS FOR PLEASURE and INFORMATION

1. Adams, Richard. WATERSHIP DOWN.
   Avon Books, paperback $2.50.
   Intermediate to adult.

   Animal story of adventure and imagination. Fiction.

2. Adamson, Joy. BORN FREE.
   Vintage Books, Random House.
   Paperback.
   Intermediate to adult.

   Story of Elsa, the lioness.

3. Adamson, Joy. LIVING FREE.
   Bantam Books, New York, paperback.
   Intermediate to adult.

   Continuing story of Elsa and the attempt to return her to her natural habitat.

4. Aliki. GREEN GRASS AND WHITE MILK.
   Thomas Crowell, New York, 1974.
   Primary.

   Explanation of the food chain.

5. Allison, Linda. SIERRA CLUB SUMMER
   BOOK. Charles Scribner's Sons. Paper $4.95. Intermediate.

   Craft projects, games and things to do during summer.

6. Allison, Linda. WILD INSIDE - Sierra Club's Guide to the Great Indoors.
   Charles Scribner's Sons. Paper $4.95. Intermediate.

   Many activities to do inside. Good ideas for classroom projects.

7. Asimov, Isaac. EARTH: OUR CROWDED SPACESHIP. UNICEF, 331 E. 38th St., New
   York, New York 10016. $2.50 plus $ .25 for handling and postage. Intermediate.

   Information about energy and population limitations.

8. Berenstain, Stan and Jan. BEARS' NATURE GUIDE. Random House, New York.
   Primary.

   "Almost everything small bears and kids need to know ... the animals, the plants, the earth itself.

9. Berenstain, Stan and Jan. BERENSTAIN BEARS' SCIENCE FAIR. Random House, New
   York. Primary.

   Many science experiments for young readers.

10. Binzen, Bill. MIGUEL'S MOUNTAIN. Coward-McCann, Inc., 1968. Fiction. Primary.

Story of a young boy's attempt to save his mountain.

11. Blake, Peter. GOD'S OWN JUNKYARD. Holt Rinehart Winston, $5.95. Intermediate to adult.

Deterioration of America's landscape. Waste and visual pollution shown in vivid photographs.

12. Burnford, Sheila. THE INCREDIBLE JOURNEY. Bantam Pathfinder Editions, Boston, Mass., Paperback. Fiction. Intermediate.

Adventure of three animals as they journey across country.

13. Burton, Virginia Lee. THE LITTLE HOUSE. Houghton-Mifflin, Boston. Fiction. Primary.

Story of a little house threatened by 'progress'.

14. Busch, Phyllis S. CITY LOTS: Living Things in Vacant Spots. The World Publishing Co., New York, 1970. $4.95. Primary.

Interrelationships among living things.

15. Chargin, Claudia. IT'S YOUR WORLD. Troubador Press, $1.50. Primary

Ecology projects and activities for young readers.

16. Davies, Brian and Porter, Eliot. SEAL SONG. Penguin Books. $5.95. Intermediate to adult.

Beautiful photographs relate story of harp seals and hunting problems.

17. Eaton, Tom. CAPTAIN ECOLOGY. Scholastic Book Services, New York. Paperback. Primary - Intermediate.

Comic book featuring Captain Ecology fighting pollution.

18. Environmental Action Coalition. IT'S YOUR ENVIRONMENT. Charles Scribner's Sons. Paper $4.95. Intermediate.

Comprehensive book covers all aspects of conservation. Many ideas and activities for students.

19. Fichter, George S. A CHANGING WORLD FOR WILDLIFE. Golden Press, Western Publishing Co., Racine, Wisconsin. Intermediate.

Information about endangered animals and problems caused by man.

20. Gabel, Margaret. SPARROWS DON'T DROP CANDY WRAPPERS. Dodd, Mead and Co. $3.95. All levels.

Ways children can help the environment.

869

21. Gans, Roma. WATER FOR DINOSAURS AND YOU. Thomas Crowell Co., New York, 1972. Primary.

The water cycle.

22. Goodridge, Harry and Dietz, Lew. A SEAL CALLED ANDRE. Warner Books. Paperback. Intermediate.

Story of life with a seal.

23. Goudey, Alice E. THE GOOD RAIN. Dutton, Inc., New York 1950. $4.45. Primary.

The importance of rain to our daily lives.

24. Henry, Marguerite. BRIGHTY OF THE GRAND CANYON. Rand McNally. Intermediate.

The story of a burro who lived in the Grand Canyon of Arizona.

25. Hyde, Margaret O. FOR POLLUTION FIGHTERS ONLY. McGraw Hill Book Co., $4.95. Primary - Intermediate.

Ideas for students for protecting the environment.

26. Jennings, Gary. THE EARTH BOOK. J.B. Lippincott Co. $4.95. Intermediate.

Suggestions to save our earth.

27. Krauss, Ruth. THE CARROT SEED. Scholastic Book Services, New York, 1972. Primary. Fiction.

The story of a small boy's attempt to grow a carrot.

28. Leaf, Munro. WHO CARES? I DO. J.B. Lippincott, Philadelphia. $1.95. All levels.

Caring for the environment. Litter problems.

29. L'Engle, Madeline. A WRINKLE IN TIME. Dell Publishing Co. Paperback $1.25. Intermediate. Fiction.

A fiction story with a conservation background.

30. Luger, Harriett. BIRD OF THE FARALLONS. Addison-Wesley, 1971. Intermediate.

Effects of oil spills on birds.

31. Masini, Giancarlo. S.O.S. SAVE OUR EARTH - An Ecological Message for Everyone. Grosset and Dunlap, New York. Intermediate.

Information regarding the problems facing our air, water, and earth.

32. McCloskey, Robert. MAKE WAY FOR DUCKLINGS. Viking Press, New York 1941. Primary.

A family of ducks trys to make their life in the city.

33. Miles, Betty. SAVE THE EARTH! An Ecology Handbook for Kids. Alfred A. Knopf Publishing Co, $4.50. All levels.

Conservation ideas for students regarding land, air and water problems.

34. Mizumura, Kazue. THE BLUE WHALE. Thomas Crowell Co., New York, 1971. $3.75. All levels.

The danger of extinction faced by the blue whale.

35. Mowat, Farley. NEVER CRY WOLF. Dell Publishing Co., paperback $1.25. Intermediate.

The true story of one man's adventures with a family of wolves in the Canadian wilderness.

36. Navarra, Dr. John. OUR NOISY WORLD. Doubleday and Co. $4.95. Intermediate.

Noise pollution, problems and solutions.

37. Navarra, Dr. John. THE WORLD YOU INHERIT. Natural History Press. $5.50. Intermediate.

The story of our polluted planet.

38. North, Sterling. RASCAL: A Memoir of a Better Era. E.P. Dutton and Co., 1963. Paperback. Intermediate

The adventures and trials of living with a raccoon.

39. Peet, William. THE WUMP WORLD. Houghton-Mifflin, Boston, Mass. $3.95. All levels. Fiction.

The Wump World is invaded by people from the planet, Pollutus.

40. Peet, William. FAREWELL TO SHADY GLADE. Houghton- Mifflin, Boston, Mass. 1966. $3.95. All levels. Fiction.

Animals homes are threatened by the bulldozer.

41. Podendorf, Illa. EVERY DAY IS EARTH DAY. Childrens Press, Chicago, 1971 $4.50 Primary.

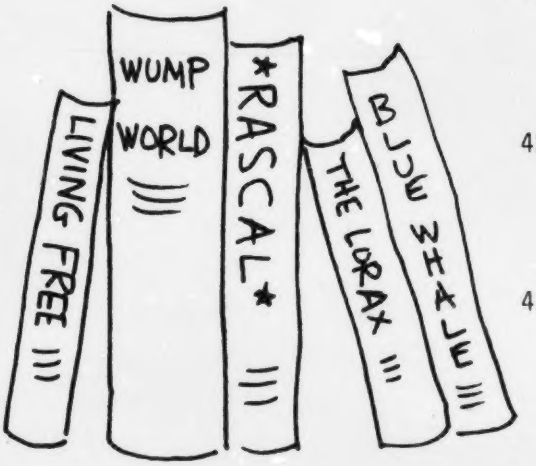
Conservation ideas to help the environment.

42. Pomerantz, Charlotte. THE DAY THEY PARACHUTED CATS ON BORNEO. Addison-Wesley, 1971. $5.95 Primary.

Animals in a change of habitat.

43. Pringle, Lawrence. THE ONLY EARTH WE HAVE. Macmillan Publishing Co. 1969. Intermediate.

Taking care of our environment.



44. Ruchlis, Hyman. THANK YOU MR. SUN! Harvey House. Primary.

    Explains all the things the sun does for us.

45. Schneider, Herman and Nina. MORE POWER TO YOU. William C. Scott, Inc., New York. Intermediate.

    Power: wind, water, steam and electric engines. Simple experiments.

46. Seuss, Dr. THE LORAX. Random House. All levels. Fiction.

    The results of local polution problems.

47. Shuttlesworth, Dorothy. LITTER - THE UGLY ENEMY. Doubleday and Co., $4.95. Intermediate.

    The pollution problems of litter.

48. Silverstein, Shel. THE GIVING TREE. Harper and Row. Fiction. All levels.

    The relationship between a man and a very giving tree.

49. Simon, Seymour. SCIENCE PROJECTS IN POLLUTION. Holiday House. $4.95. Intermediate.

    Projects to discover causes of pollution. Suggestions of things to do.

50. Simon, Seymour. SCIENCE PROJECTS IN ECOLOGY. Holiday House. $4.95 Intermediate.

    Twenty projects to help study living things in their environments.

51. Sootin, Harry. EASY EXPERIMENTS WITH WATER POLLUTION. Four Winds Press. $5.50. All levels.

    Experiments with water pollution.

52. Stillwater, Maitreya. WINDOWS OF NATURE: A Story-Coloring Book. Troubador Press. Paper $1.95. Intermediate.

    Stories and poems about nature with lovely pictures to color.

53. Stone, A. Harris. THE LAST FREE BIRD. Prentice-Hall, Inc., New Jersey. All levels.

    How the natural habitat of birds is being destroyed by man.

54. Tison, Annette and Taylor, Talus. BARBAPAPA'S ARK. Scholastic Book Services. Paper $1.95. Primary.

    Animals and conservation.

55. Waters, John F. GREEN TURTLE MYSTERIES. Thomas Crowell Co., New York, 1972. Intermediate.

    Story of the endangered giant green sea turtle.

56. Weaver, Harriett E. FROSTY: A RACCOON TO REMEMBER. Archway Paperbacks, Pocket Books, New York. Intermediate.

Adventures of living with a raccoon.

57. Wentworth, Daniel F., Couchman, J. Kenneth, MacBean, John C., Sticher, Adam. ECOLOGY IN THE COMMUNITY. Winston Press. $4.95 paper. Intermediate.

Understanding, observing and recording ecology in your community.